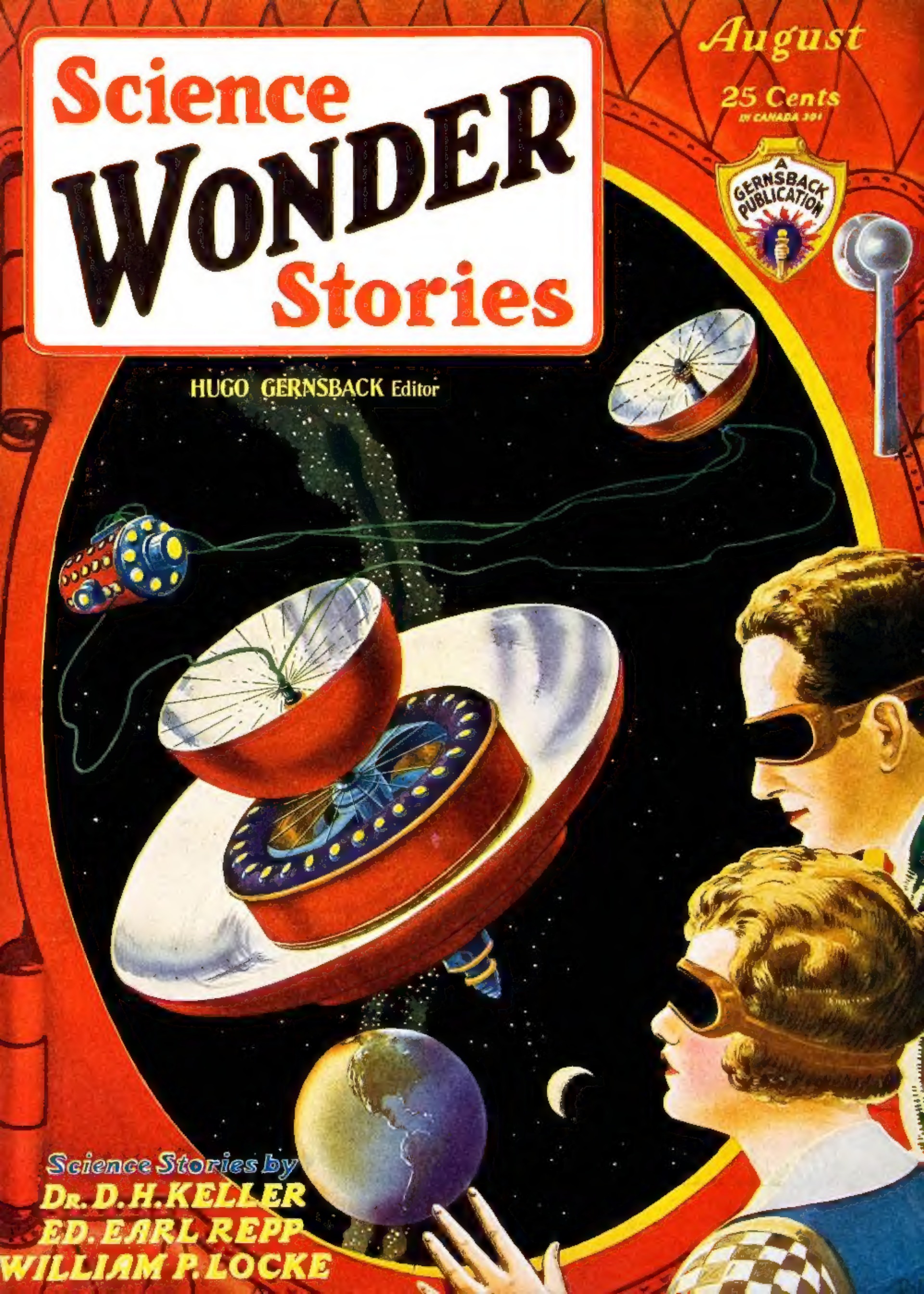
Science WONDER Stories

August

25 Cents
IN CANADA 30¢

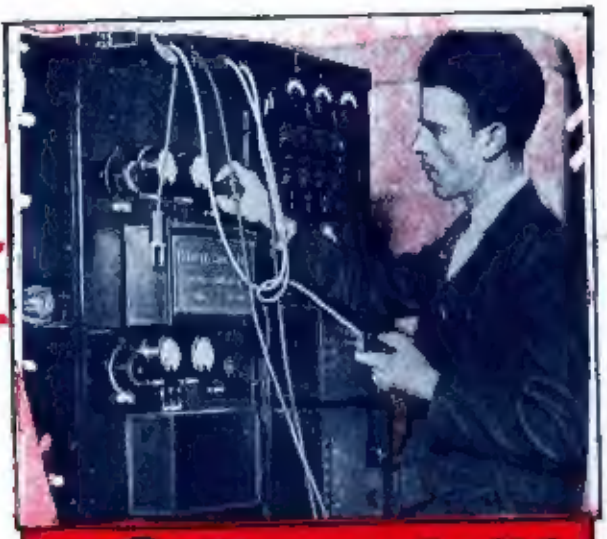
A GERNSBACK PUBLICATION

HUGO GERNSBACK Editor



Science Stories by
DR. D. H. KELLER
ED. EARL REPP
WILLIAM P. LOCKE

I Will Train You at Home to Fill a Big-Pay Radio Job



If you are earning a penny less than $50 a week, send for my book of information on the opportunities in Radio. It's FREE. Clip the coupon NOW. A flood of gold is pouring into this new business, creating hundreds of big pay jobs. Why go along at $25, $30 or $45 a week when the good jobs in Radio pay $50, $75 and up to $250 a week. My book "Rich Rewards in Radio" gives full information on these big jobs and explains how you can quickly become a Radio Expert through my easy, practical home-study training.

Salaries of $50 to $250 a week not unusual

Get into this live-wire profession of quick success. Radio needs trained men. The amazing growth of the Radio business has astounded the world. In a few short years three hundred thousand jobs have been created. And the biggest growth of Radio is still to come. That's why salaries of $50 to $250 a week are not unusual. Radio simply hasn't got nearly the number of thoroughly trained men it needs. Study Radio and after only a short time land yourself a REAL job with a REAL future.

You Can Learn Quickly and Easily in Spare Time

Hundreds of N.R.I. trained men are today making big money—holding down big jobs—in the Radio field. Men just like you—their only advantage is training. You, too, can become a Radio Expert just as they did by our new practical methods. Our tested, clear training makes it easy for you to learn. You can stay home, hold your job, and learn quickly in your spare time. Lack of education or experience is no drawback. You can read and write. That's enough.

Many Earn $15, $20, $30 Weekly on the Side While Learning

My Radio course is the famous course "that pays for itself." I teach you to begin making money almost the day you enroll. My new practical method makes this possible. I give you SIX BIG OUTFITS of Radio parts with my course. You are taught to build practically every type of receiving set known. M. E. Sullivan, 412 73rd Street, Brooklyn, N. Y., writes: "I made $720 while studying." Earle Cummings, 18 Webster Street, Haverhill, Mass., "I made $375 in one month." G. W. Page, 1807 21st Ave., Nashville, Tenn., "I picked up $935 in my spare time while studying."

Your Money Back if Not Satisfied

I'll give you just the training you need to get into the Radio business. My course fits you for all lines—manufacturing, selling, servicing sets, in business for yourself, operating on board ship or in a broadcasting station—and many others. I back up my training with a signed agreement to refund every penny of your money if, after completion, you are not satisfied with the course I give you.

ACT NOW — 64-page Book is FREE

Send for this big book of Radio information. It won't cost you a penny. It has put hundreds of fellows on the road to bigger pay and success. Get it. Investigate. See what Radio has to offer you, and how my Employment Department helps you get into Radio after you graduate. Clip or tear out the coupon and mail it. RIGHT NOW.

J. E. SMITH, President,
Dept. 9VA1
National Radio Institute
Washington, D. C.

RADIO NEEDS TRAINED MEN!

Here's the PROOF

Has Made $10,000 More in Radio

"I can safely say that I have made $10,000 more in Radio than I would have made if I had continued at the old job. When I enrolled with you I didn't know a volt from an ampere. I advise all ambitious young men to get into Radio. There is no greater opportunity."
Victor L. Osgood,
7101 Bay Parkway,
Brooklyn, N. Y.

$375 One Month in Spare Time

"Recently I made $375 in one month in my spare time installing, servicing, selling Radio Sets."
Earle Cummings,
18 Webster St.,
Haverhill, Mass.

$450 a Month

"I work in what I believe to be the largest and best equipped Radio shop in the Southwest and also operate KGFI. I am averaging $450 a month."
Frank M. Jones,
922 Guadalupe St.,
San Angelo, Tex.

You can build 100 circuits with the six big outfits of Radio parts I give you

3 of the 100 you can build

Find out quick about this practical way to big pay

Mail This FREE COUPON Today

Washington, D. C.

Dear Mr. Smith: Kindly send me your big book "Rich Rewards in Radio," giving information on the big-money opportunities in Radio and your practical method of teaching with six big outfits. I understand this book is free, and that this places me under no obligation whatever.

Name .....Age.....

Address .....

City .....State .....

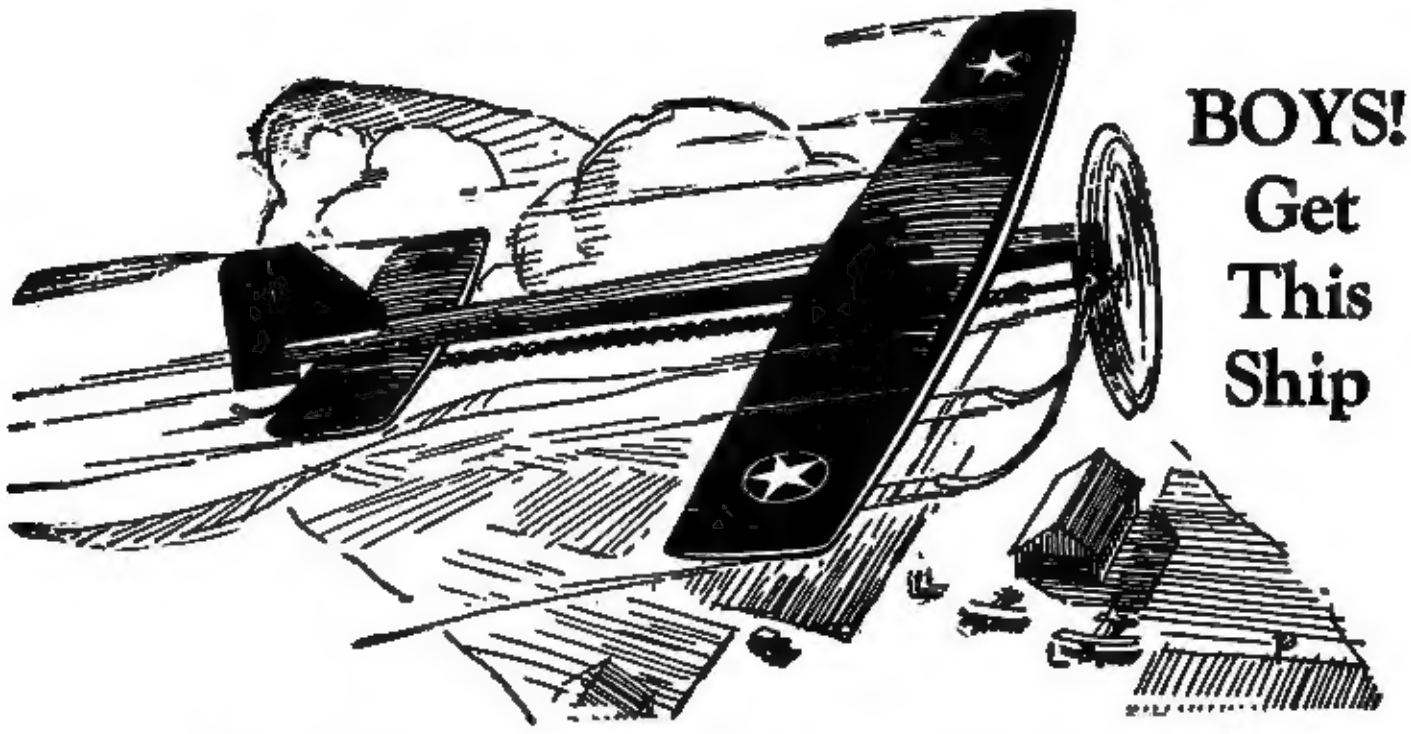
Employment Service to all Graduates

Originators of Radio Home Study Training

A Supreme Achievement in a Model Plane

The RED ACE

Combat Pursuit Ship



BOYS! Get This Ship

Rises from Ground—Soars 60 Feet

The development of the Red Ace Combat Pursuit Ship will be nothing short of sensational in the world of model planes. Here's one plane that will not disappoint you—one plane that will perform like a real ship. Has wing spread 16" with main fuselage 14"; reinforced main wing; perfectly balanced tail wing and adjustable rudder. Main wing can be shaped to suit conditions. Has front landing gear and rear skid. The perfectly carved 7" wood propeller is a particularly fine feature. Has ball bearings on propeller shaft; 6 ply motor of newly developed extra strong para rubber. This is not a construction set, but a completely assembled plane. Simply fasten wings and launch.

Will Outperform Planes Costing 5 Times More

The Red Ace will rise from ground under its own power. Will climb easily to 60 feet. Will soar over rooftops and buildings. Then, glide perfectly to earth. This large-sized, carefully made plane will outperform many planes costing 5 times more. It is guaranteed to fly. It is guaranteed to rise from the ground under own power. This plane will please any boy immensely. A perfect marvel of simplicity and powerful performance. Whether you now own a model plane or not, whether you own 50 model planes, you will want the Red Ace. It will be the prize ship in your hangar. Don't let a day slip by until you order this plane.

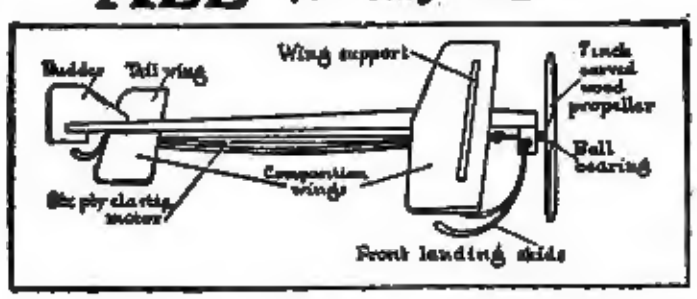
You May Have It FREE!

The Open Road for Boys Magazine has 50 pages every month crammed with thrilling, breath-taking stories that will hold you spellbound. Just the kind of stories you've been looking for. Interesting, tense stories of high adventure on land and sea and in the air. Tales of deep mystery. Airplane stories, the best published. Sport stories, stories of school life. Marvelous departments and special instructive articles. Lots about model planes. The Open Road for Boys is the fastest-growing boys' magazine in America. You'll think it is great! Regular subscription price $1 a year. Rush us your subscription today on coupon below and we will give you free the Red Ace Combat Pursuit Ship. But you must act at once.

Hurry Your Order→
TODAY

Look at These Great Features

ALL *for only* $100



The Red Ace is a plane so carefully thought out, so cleverly constructed that it will enable you to compete with other boys with the most expensive planes, and win! This plane is a remarkable performer—a plane that you will be proud to own.

This Is a Great Bargain Offer

Pilot Barclay, Open Road for Boys,
130 Newbury St., Boston, Mass.

Canadian postage 50c extra.
Foreign $1 extra.

Friend:
Bet your life! I will grab the big offer. Here's my dollar. Put me down for a year's subscription to The Open Road for Boys and rush me the Red Ace Combat Pursuit Ship.

Name .....
Street .....
Town or City .....
State .....

Vol. 1, No. 3

Publication Office, 404 North Wesley Ave., Mt. Morris, Ill.
Editorial and General Offices, 96-98 Park Place, New York City.
Published by
STELLAR PUBLISHING CORPORATION
H. GERNSBACK, Pres. I. S. MANHEIMER, Sec'y. S. GERNSBACK, Treas.

AUGUST, 1929

Table of Contents
August

THE MOON BEASTS
By William P. Locke 198
THE RADIUM POOL
(A Story in Two Parts) (Part I)
By Ed Earl Repp 218
THE ETERNAL MAN
By D. D. Sharp..... 230
THE ALIEN INTELLIGENCE
(A Story In Two Parts) (Part II)
By Jack Williamson..... 234
THE FEMININE METAMORPHOSIS
By David H. Keller, M.D..... 246
THE PROBLEMS OF SPACE FLYING
(Part II)
By Captain Hermann Noordung, A. D., M.E. 264
WHAT IS YOUR SCIENCE KNOWLEDGE?
Science Questionnaire 273
SCIENCE NEWS OF THE MONTH 275
WHAT SCIENCE FICTION MEANS TO ME
Prize Contest Letters..... 279
THE READER SPEAKS
Letters From Our Readers..... 280

ON THE COVER

this month is illustrated Captain Noordung's Space House. The view shown is from another space flyer with the Earth and Moon seen through the window of the observers. In the center is the space house proper, which has a total diameter of about 150 feet. The wide curved surfaces are the reflectors which collect and concentrate the sun's heat. Attached to the space house by means of flexible cables, at the left is shown the observatory and at the upper right the engine house. All three objects remain fixed in space, there being no gravity to dislodge them.

NEXT MONTH

THE ONSLAUGHT FROM VENUS, by Frank Phillips. You will remember Mr. Phillips as the author of "Armageddon 2419 A.D.," as well as "The Airlords of Han." Here, this versatile author is back with a most marvelous interplanetarian story—but quite the reverse of the usual story. This author has a knack of evolving a science fiction style all his own, which seems to be unmatched anywhere. You simply must read this story.

THE RADIUM POOL, by Ed Earl Repp. If you have enjoyed the first part of this story, you will enjoy the final installment just about twice as much. It is an unforgettable story and certainly one of the outstanding ones of the season. The strange inhabitants from the far distant world are now getting down to business in earnest and incredible things are happening. The story will keep you at fever heat and we certainly trust that Mr. Repp can be induced to write a sequel to it.

THE CUBIC CITY, by Rev. Louis Tucker, D.D. Here is something entirely new in science fiction. It certainly is one of the most prophetic stories that we have ever read and when you finish it, you will say, yes, why not? Transportation in our cities is the curse of our modern civilization. Rev. Tucker seems to have solved the problem and you wonder when you finish reading, whether you have read fiction or a serious article.

THE HUMAN TERMITES, by Dr. David H. Keller. When we remove our gaze from the stars and fasten them on the lowly insects beneath our feet, we find a world that is strange beyond comprehension. In this masterly story of the rise of the termite (the white ant) Dr. Keller has outdone himself. Founded upon the actual facts known about the termite, Dr. Keller has made a thrilling, fast moving and yet scientific adventure tale that at times takes on an epical sweep. It is a story that will make history.

AND OTHERS

SCIENCE WONDER STORIES is published on the 3rd of the preceding month. 12 numbers per year, subscription price is $3.50 a year in United States and its possessions. In Canada and foreign countries, $4.00 a year. Single copies 25c. Address all contributions to Editor, SCIENCE WONDER STORIES, 96-98 Park Place, New York. Publishers are not responsible for lost Mss. Contributions cannot be returned unless authors remit full postage.
SCIENCE WONDER STORIES—Monthly—Entered as second class matter in the Post Office at Mt. Morris, Ill., under act of March 3, 1879. Title registered U. S. Patent Office. Trademarks and copyrights by permission of Gernsback Publications, Inc., 98 Park Place, New York City, owner of all trademark rights. Copyright 1929, by G. P., Inc. Text and illustrations of this magazine are copyright and must not be reproduced without permission of the copyright owners.
SCIENCE WONDER STORIES is for sale at principal newsstands in the United States and Canada. European agents: Brentano's, London and Paris. Printed in U. S. A.
IF YOU WISH TO SUBSCRIBE to SCIENCE WONDER STORIES, make out all remittances to the Stellar Publishing Corp.,
Be sure to mention the name of magazine you wish to subscribe for, as we are also agents for the following magazines: RADIO-CRAFT and AIR WONDER STORIES, subscription price of which is the same as SCIENCE WONDER STORIES. Subscriptions can be made in combination with the above publications, at a reduced club rate. Ask for information. Subscriptions start with current issue.
WHEN YOUR SUBSCRIPTION EXPIRES, we enclose a renewal blank in the last number. No subscriptions continued unless renewal remittance received.
Change of Address. Always give us old as well as new address and notify us as far in advance as possible.

STELLAR PUBLISHING CORPORATION
Editorial, General and Advertising Offices, 96-98 Park Place, New York City
Publication Office, 404 North Wesley Avenue, Mt. Morris, Illinois.

AVIATION STORIES of the FUTURE

Contents of August Issue

"The Silent Destroyer"
By Henrik Dahl Juve

"Beyond Gravity"
By Ed Earl Repp

"The Ark of the Covenant"
By Victor MacClure

"The Planet's Air Master"
By Edward E. Chappelow

"What Is Your Aviation Knowledge?"
Aviation Questionnaire

Aviation News of the Month

The Reader Airs His Views
Letters from Our Readers

AIR WONDER STORIES which is for sale now on all newsstands at 25c the copy, is a fitting sister magazine to SCIENCE WONDER STORIES. It is a revelation in science fiction stories of the air. Be sure to procure a copy now or make yourself sure of it by a subscription.

AIR WONDER • STORIES

REGULAR SUBSCRIPTION RATES

$2.50 in U. S.
$3.00 in Canada and foreign.

SPECIAL PRICE

8 ISSUES FOR $1.00

Editorial Staff

HUGO GERNSBACK, Editor-in-Chief

DAVID LASSER, Literary Editor FRANK R. PAUL, Art Director

Associate Aviation Editors

FELIX W. PAWLOWSKI, M. & E.E., M.S.,
Professor of Aeronautical Engineering, University of Michigan

EARL D. HAY, B.S., M.S., M.E.,
Head of Department of Mechanical and Industrial Engineering and Professor of Aeronautics, University of Kansas

GEORGE J. HIGGINS
Associate Professor of Aeronautics, University of Detroit

MAJOR WILLIAM A. BEVAN, Air Corps Reserve
Associate Professor Aeronautical Engineering, Purdue University

JOHN E. YOUNGER, B.S., M.S., Ph.D.
Professor of Mechanical Engineering, University of California

A GERNSBACK PUBLICATION

STELLAR PUBLISHING CORPORATION
Dept. SW-8, 96-98 Park Place,
New York, N. Y.

Enclosed find $1.00 for which enter my subscription to your new monthly magazine AIR WONDER STORIES for 8 (eight) months. Please mail all copies to address below.

Name _____

Address _____

City and State _____

WANTED
A young man of practical experience, with a thorough training in electrical engineering. The position offers $75 per week to start. The opportunity is unlimited. Address Box C. L. 842, listing qualifications and giving references.
HOUSEWORKERS
GOVERNESSES.
ONLY.
WAITRESSES.
CANVASSERS—Sell newly patented auto invention.

How Would You Answer It?

THERE are advertisements in every issue of the great dailies in a dozen American metropolitan centers that offer just as attractive openings as this. *"The opportunity is unlimited"* if you have the required knowledge. There is always room at the top for trained men.

Such advertisements will still be in the papers a year—two years—five years from now. If you have the foresight and the courage to prepare yourself, you can be ready to step into such a position when it is offered. Whatever your work may be today, you can start at once to train yourself for a bigger job, at a higher salary, in your chosen career.

Right at home, in the spare-time hours you may now be wasting, the International Correspondence Schools will fit you for advancement. And whether you left school in the grades or went on to obtain a high school or college education, you will find among the 300 courses provided by the I. C. S. exactly the kind of training you need.

It won't cost you a cent or obligate you in any way to ask for our Free Booklets and complete information about the International Correspondence Schools. But that one simple act *now* may change the course of your whole life a few years hence.

Mark and Mail the Coupon Today

INTERNATIONAL CORRESPONDENCE SCHOOLS *"The Universal University"* Box 5741, Scranton, Penna.

Without cost or obligation, please send me a copy of your booklet, "Who Wins and Why," and full particulars about the subject *before* which I have marked X in the list below:

TECHNICAL AND INDUSTRIAL COURSES

☐ Electrical Engineering	☐ Gas Engine Operating	☐ Architects' Blueprints	☐ Automobile Work
☐ Electric Lighting	☐ Civil Engineer ☐ Mining	☐ Contractor and Builder	☐ Airplane Engines
☐ Mechanical Engineer	☐ Surveying and Mapping	☐ Architectural Draftsman	☐ Agriculture
☐ Mechanical Draftsman	☐ Plumbing and Heating	☐ Concrete Builder	☐ Navigation
☐ Machine Shop Practice	☐ Steam Engineering	☐ Structural Engineer	☐ Mathematics
☐ Railroad Positions	☐ Architect	☐ Chemistry ☐ Pharmacy	☐ Radio

BUSINESS TRAINING COURSES

☐ Business Management	☐ Traffic Management	☐ Advertising ☐ Salesmanship	☐ Railway Mail Clerk
☐ Industrial Management	☐ Cost Accounting	☐ Business Correspondence	☐ Common School Subjects
☐ Personnel Management	☐ Bookkeeping	☐ Show Card and Sign Lettering	☐ High School Subjects
☐ Accounting and C.P.A. Coaching	☐ Secretarial Work	☐ Stenography and Typing	☐ Illustrating
	☐ French ☐ Spanish	☐ Civil Service ☐ English	☐ Cartooning

Name..... Street Address.....

City..... State..... Occupation.....

Persons residing in Canada should send this coupon to the International Correspondence Schools Canadian, Limited, Montreal, Canada

VOLUME 1
No. 3

Science WONDER Stories

AUGUST
1929

Editorial, Advertising and General Offices, 96-98 Park Place, New York, N. Y.

· · · · · Prophetic Fiction is the Mother of Scientific Fact · · · · ·

HUGO GERNSBACK, *Editor-in-Chief*

DAVID LASSER, *Literary Editor* FRANK R. PAUL, *Art Director*

ASSOCIATE SCIENCE EDITORS

ASTRONOMY
Professor Samuel G. Barton
Flower Observatory, University of Pennsylvania.
Dr. Clyde Fisher, Ph.D., LL.D.
Curator, The American Museum of Natural History.

ASTROPHYSICS
Donald H. Menzel, Ph.D.
Lick Observatory, University of California.

BOTANY
Professor Elmer G. Campbell
Transylvania College
Professor Margaret Clay Ferguson, Ph.D.
Wellesley College
Professor C. E. Owens
Oregon Agricultural College

CHEMISTRY
Professor Gerald Wendt
Dean School of Chemistry and Physics
Pennsylvania State College

ELECTRICITY
Professor F. E. Austin
Formerly of Dartmouth College.

ENTOMOLOGY
William M. Wheeler
Dean, Bussey Institution for Research in Applied Biology, Harvard University.

MATHEMATICS
Professor C. Irwin Palmer
Dean of Students
Armour Institute of Technology
Professor James Byrnie Shaw
University of Illinois
Professor Waldo A. Titsworth, S.M.
Alfred University.

MEDICINE
Dr. David H. Keller
Western State Hospital

PHYSICS AND RADIO
Dr. Lee deForest, Ph.D., D.Sc.

PHYSICS
Professor A. L. Fitch
University of Maine

PSYCHOLOGY
Dr. Marjorie E. Babcock,
Acting Director, Psychological Clinic, University of Hawaii

ZOOLOGY
Dr. Joseph G. Yoshioka
Illinois State Institute for Juvenile Research

These nationally-known educators pass upon the scientific principles of all stories.

THE WONDERS OF SPACE

By HUGO GERNSBACK

IF it were not that "familiarity breeds contempt" one of the most common things in the universe would probably be a source of constant amazement to us. As it is SPACE, one of the greatest enigmas of all time, very seldom claims our attention. The greatest philosophers, scientists and mathematicians have for centuries occupied themselves with the problem of the nature of universal space, but without arriving at any definite conclusion.

We of today accept space as we find it, and seldom if ever question its nature, its limitations or even its significance. As a general thought, it is accepted that space is limitless and fathomless, stretching into infinity in all directions. This becomes a most terrific statement if one ponders long enough upon it; because it goes contrary to our entire instinctive reasoning. For, with our finite minds, we simply cannot conceive of things without finite limits.

Of late, Einstein and a number of other mathematicians, including Minkowski, have pronounced the theorem that space in itself is not infinite, but limited and as they claim, returns upon itself like a gigantic, closed, curved surface. It seems that, mathematically, they are even able to prove this. Yet, one may ask, if this be true, then what is outside the portion of space that is so curved?

The mathematician has given proofs that there need not necessarily be anything; but the average layman will not accept this view, as his common sense forbids such reasoning. Yet Einstein and Minkowski, probably, are right in an ultimate sense.

There is not room here to discuss the various mathematicians and all their contentions; but, anyone so inclined, may obtain text-books to go into the subject more thoroughly.

Yet even Einstein, along with the rest of our astro-physicists, cannot help but wonder at the tremendous vastness of space. Our own universe, which is but a small part of known space, has a diameter of 200,000 light years, which means that a light ray traveling at the rate of 186,000 miles a second would take 200,000 years to travel from one end of *our own* universe to the other.

The question must arise to many, what is space, what is the nature of it and why does it exist? No satisfactory answer can be forthcoming to such questions; and our minds, as they are constituted, cannot grasp the mechanics of space in their entirely. The mind stands appalled when it contemplates the magnitude of space, and brings home to us only our own futility and our own insignificance compared to that universal abyss.

While we may never hope to know what space really is, we are making some little progress in the discovery of what space contains. But, even here, it is most astonishing to find that the material contents of space are insignificant compared to space itself.

If you could roll together all of the suns, dead and alive, all the planets and all other matter contained in space into one huge sun, the part of space taken up by such a body would still be infinitesimal compared to the extent of space itself. And, if it were located on the borderline of our universe, it is doubtful whether it would be large enough for anyone to even see it from a neighbor universe.

Matter compared to the emptiness of space is therefore insignificant and it might be argued that all the matter in the universe is comparatively so small that in a universal sense it does not exist. It would be smaller than a single electron in the Pacific Ocean.

It has been found that space is a most perfect vacuum; in fact, a much better vacuum than is found in the most highly-evacuated X-Ray tube, which itself contains a pretty perfect vacuum.

At one time it was thought that space contained quite a good deal of so-called cosmic dust, but this view is no longer countenanced. It is true that space does contain a goodly number of bodies, such as meteorites (which, however, are only fragments of shattered worlds that were in existence once). But the quantity of such meteors is exceedingly small and probably they are found only in the comparative vicinity of the sun of our own planetary system. It is doubted whether many meteorites are in existence beyond the orbit of Neptune, the furthest now-known planet of our solar system.

To profound thinkers, the thought must often occur that, of necessity, space must have existed before matter. It would seem impossible that the reverse could be true. And if space did exist before matter, the thought arises, how was matter originally created out of this vast nothingness? These are some of the secrets of space on which it is futile for the human mind to conjecture. We can only speculate about it, but it is doubtful whether we shall ever know much about it.

Indeed, it is quite possible that our entire views on space and matter are entirely erroneous—principally because the workings of the human mind, based upon mundane conditions, can make no satisfactory picture of the tremendous stellar magnitudes involved. It is similar to the problems of the fourth and higher dimensions, which the human mind cannot encompass. Our minds, in short, are too finite and are probably perfectly insulated against all the greater and universal truths.

The MOON Beasts

by William P. Locke

All of a sudden the scattered debris near began literally to fly to pieces; stems, branches, boughs and soil were resolved into a swirling cloud of mottled dust before the pulverizing blast.

CHAPTER I

A Travel Talk

J. EVERHART STEWART, globe trotter, big game hunter, sponsor and member of several scientific expeditions to distant and unexplored regions, was delivering one of the Sunday afternoon illustrated lectures and travel talks at the Field Museum of Natural History, Chicago. His subject was "Among the New Guinea Pygmies," and with both verbal and visual pictures he carried his audience on a reconstructed journey of a recent expedition into the interior fastnesses of the largest and least known island on earth. He particularly dwelt on the difficulties encountered in surmounting the well nigh impenetrable jungle extending even to the very shores of this inhospitable land.

"We ascended the largest river," he explained in introduction, "in our special light draft steamer as far as we could, continually sounding our way to follow the winding channels. Then we used our seaplane to reconnoiter further and map out a number of clearings indicating the probable location of Pygmy settlements. Having determined our objective, our real task was before us—to force our way through the matted tangle of jungle and reach the home grounds of the never before visited savages. We ascended to the headwaters of such streams as were on our course by the wonderful ability of our Dyack boatmen—brought with us from Borneo—in overcoming the many rapids and other obstructions. Eventually we could proceed no further by water and then were obliged to hack our way into the bordering wall of rank vegetation.

"Our progress then became slow indeed. A mile a day was about our average, although on some days we did not advance one-fourth that distance. After a week or so at this kind of work we began to have serious misgivings about being able to reach the selected clearing which was, we estimated, fully half a hundred miles further. And it is more than probable that we would never have been successful in our accomplishment and been able to show you these scenes of the Pygmies in their home surroundings had it not been for a quite unexpected, very extraordinary and most fortuitous circumstance. This was nothing less than a broad, comparatively clear roadway running in the

WILLIAM P. LOCKE

general direction in which we were headed and which we later found passed within a few miles of our goal.

"But when I say 'roadway' don't conjure in your minds a seemingly endless ribbon of smooth concrete, or even a common dirt road bordered by barbed wire fences. This was a road, or rather trail, the likes of which none of us had ever seen or heard of. It was a veritable hole through the heart of the jungle, an arboreal tunnel, bored by some unknown, strange and powerful agency; a something that had burned a strip of living vegetation into crumbling rottenness and so poisoned the soil as to effectually prevent any regrowth.

"But the jungle had by no means given up its hope of reconquest. Deprived of a foothold in the soil it had gone aloft and arched over the scar, dropping festoons of vines and creepers in its endeavor to fill the void. As the pictures show it was not altogether what might be called an open road, but compared to chopping our way, as we had been doing, it afforded immeasurable relief. The probable cause was a subject for endless discussion then and ever since but no satisfactory explanation has yet been vouchsafed. But more of that later.

"I will now take you to our outfitting headquarters and acquaint you with the personnel of this expedition and we will begin our journey to the land of the Pygmies."

As he finished his very interesting talk and prepared to leave the stage, an usher handed Mr. Stewart a card. He glanced at the unfamiliar name and then read the penciled note on the reverse— "Would like a few minutes—Am sure I can explain your jungle road."

"Well, well!" he ejaculated, "That's surely interesting. Bring in the gentle-

THE tricks of nature are always far more surprising than fiction. It is well-known that living organisms invariably adapt themselves to surroundings, so much so in fact, that in their evolution, the various animals take on the most grotesque appearances.

If there is no light, for instance, the creature finds it necessary to create its own light, as do a number of deep sea fishes. If the animal is too large and cumbersome to bend down or bend up in order to reach its food, we get the surprising forms of the elephant and the giraffe.

Nature, in other words, is a most prolific source of invention and out-distances humans as inventors at all times.

In his "Moon Beasts," Mr. Locke describes one of the most extraordinary animals that has ever been portrayed, but there is no question that the science is adequate to the subject.

Indeed, if conditions on a far distant world were such as described by the author, there is no good reason why animals of the type that he writes of could not be solved.

Incidently, the present story is a rattling good one that will keep you constantly on your toes.

man." A clean cut, comparatively young man of good appearance accompanied the usher on his return.

"My name is Joseph S. Crawford as you see by my card, and I'm much pleased to meet you personally, Mr. Stewart. I greatly enjoyed your lecture, and was particularly interested, I might say 'flabbergasted' if you will pardon the expression, when you began to describe that jungle road. That accounted for two of them and, I feel sure,—I'm confident there must be another that hasn't yet been discovered."

"I—er—I don't quite understand," Stewart answered with a puzzled expression. "I can't make out your interest unless—Were you ever in New Guinea?"

"No, sir. Never. We found ours much closer than that."

"You found—what?"

"I've had the experience of also following a path or road such as you described, but through the Northern underbrush not over a thousand miles from here. I know and actually saw what caused it and had good reasons to believe there might be one or two more; but did not quite expect they were so far away, at least to hear of them there. Perhaps we'll hear of the third soon—maybe in China or Siberia."

"And what was this cause you claim to have seen in your case, Mr. Crawford?"

"That is something that cannot be described offhand, Mr. Stewart. I, you, or no one else in the world would guess it in a thousand years unless they had an experience similar to mine. Even now it seems incredible, a fantastic dream. But I assure you there is a very sinister and marvelous power at the back of it, a power beyond earthly limitations and present knowledge, and one that may have direct consequences to the future existence of all life on this planet as we now know it. Would it be possible to arrange to discuss this matter in a more convenient place and at greater length than we can here? I am sure you will be more than interested in what I have to tell——"

Crawford's Tale

TEN minutes past eight, conventional greetings over, chairs drawn up, cigars lighted, and an expectant expression on Mr. Stewart's face. And Crawford began. This is the story he told.

* * * * *

I am going to follow the plan of your talk of this afternoon, and tell things in sequence as they happened. But you must not expect as finished a recital as was yours, nor can I give the convincing proof of photography. However, I have with me a few souvenirs which, considering your experience, might be classed as evidence, and will be presented shortly.

A year ago last July, an old pal and co-worker by the name of Barry Edwards and I started on a vacation trip. (Barry left on a week-end trip or he would be here now, too.) We had, for over a year, been strenuously engaged in radio research work and felt like getting as far away from inductances, capacities, electrons, and kilocycles as our time would permit. We landed up in the Lac Lareau country, among the countless lakes and streams a couple of hundred miles north of Lake Superior. Here we engaged a guide, a half-breed named Jules, and the necessary equipment for a fishing trip of several weeks. Our desire was to get into the real wilderness, away from the ordinary routes as much as possible, and we so instructed our guide. After several days of continuous paddling and numerous portages, we came to a very pretty, clear lake where we decided to make our permanent camp. The fishing proved all that could be expected and we were all set for a nice, enjoyable and restful time—so we thought.

But during the second night at this camp an event took place which ultimately imposed upon us a series of hardships, privations, and bewildering developments we never in the world had expected.

It was a beautiful night, a clear sky and a full moon, one of those when you don't feel inclined to retire lest you shorten your enjoyment of the bewitching beauty. Anyhow, I felt that way, and along about midnight, after Barry and Jules had sought their blankets, I got into the canoe and paddled out on the moonlit waters. The lake was about three miles long and one wide. Near the center it made a turn at nearly right angles, so that it was shaped like the letter L. Jules had some unpronounceable Indian name for it but we dubbed it Angle Lake. One end lay to the west, the other to the south, and it was at the western end that our camp was pitched.

Slowly paddling along, I had passed the point where the southern end came into view and continued on toward the center. A faint, wavering breeze had sprung up from the south and a silvery lane of rippling moonlight extended toward the further end and the inlet by which we had entered. In contrast to the brightened waters, the deeply wooded shores were as black as a silhouette. The occasional splash of a fish breaking water, the deep r-rum of a bull frog in the weed-beds, and the gentle lapping of wavelets against the canoe were the only sounds that broke the primal stillness.

Stretched out in the bottom and drifting along, my mind lost in reveries, perhaps dozing a little, I became conscious of a sound, which I first thought was an increasing breeze sighing through the pines. As it grew gradually louder it was comparable to the distant patter of rain. Getting curious, I sat up to investigate. Everything was as serene as before, no indication of wind or rain in evidence. And yet the sound grew more distinct and closer. Listening intently, it seemed localized to a small area somewhere on the southeast shore, but as if in motion. Soon I was able to distinguish the snapping of twigs and the crashing of boughs as though some heavy body were tearing through the trees. Then the rending sound suddenly became a dull roar, and a white streak shot out of the blackness

across the water. Scarce a half-mile away, a boiling, churning ridge of water like the wake of an oversized and incredibly fast hydroplane was crossing the lake; and strain my eyes as I might, no cause for this unusual disturbance was to be seen.

And then a fleeting shadow slid over the canoe and was gone. Looking up, I saw a dark shape passing the face of the moon, its outlines rather sharply defined for an instant; then merging into a faint blot in the hazy ring which I now saw surrounded our satellite. It did not appear to be at a very great height, but that was hard to judge; and there was no doubt of its being the cause of the turmoil in the lake, for the disturbance followed directly beneath. Before I had much more than a glance, it had crossed the water. The roaring suddenly stopped, the crashing and tearing began anew, and, gradually as it had begun, the sound died out in a fainter and ever fainter sighing of wind through the pines. Soon the canoe was bobbing over a series of waves as though in the wash of a steamer; and excepting the sound of waves breaking on the shores everything became as quiet and placid as before. I took up the paddle and headed for camp.

Jules was awaiting me as I made shore. There was a suppressed excitement in his actions as we secured the canoe. I asked him if he had seen or heard anything unusual.

"Mecater Joe," he answered, "I sleep—and by and by I hear much rain. I look and see no rain. I think maybe much wind blow, but feel no wind here—hear it over there. Purty soon waves come, some, not much—no wind waves. No rain—no wind—some waves, Bien! It is what? Maybe you see something—yes?"

I told him what I had observed and then asked if he had ever seen or heard of any aircraft in these parts. The nearest he had come to seeing any were pictures in newspapers and magazines and none had ever been known to be in the vicinity. Just then Barry emerged from the tent and drowsily inquired what all the rumpus was about. I explained and we discussed the unusual occurrence for some time, finally deciding to await daylight to afford some clew.

CHAPTER II

Investigating

EARLY the next morning we paddled down the southern extension of the lake toward the locality where the strange object had crossed. From a distance we noticed innumerable white specks dotting the surface. They proved to be fish—dead and belly up—hundreds of them, all kinds and sizes, from finger-long perch to three-foot muskies floating almost entirely out of the water. What a shame, we thought, that they should go to waste. I reached out and grabbed a three-pound pike intending to examine it. It broke up of its own weight and the section I held in my hand crumbled in my grasp. I threw it from me in disgust and dipped my hand in the water to wash off the supposed sliminess. It came out perfectly clean and no trace of odor was perceptible! I tried it again. We found that, instead of a nauseating, decomposed organic mass as I had suspected, there was only a chalky substance, a loosely cohering plaster-of-paris replica that crumbled into powder at the merest touch. We could only marvel at this incomprehensible transformation.

It had been Barry's opinion that I had seen a stray dirigible discharging its water ballast in an emergency. But I had already pointed out that it was not of the conventional shape as far as my observation went. And if it had been discharging water or sand or any material substance in the quantity necessary to cause the effects produced I surely would have been able to detect it. The finding of the calcined fish had entirely upset his theory, I could see, and left him without a reasonable supposition to advance. And as was his wont in such circumstances, he said nothing.

Noticing a break in the continuity of the deeply wooded shore line we paddled over, made a landing, and examined the surroundings. From the water's edge a well defined trail led inland. The underbrush showed that it had been subjected to a very severe disturbance. Saplings and bushes were flattened out, boughs, branches, and even limbs from the larger trees were strewn over the ground or hanging interlocked with others and it seemed as though the disruption was more severe at the sides than directly in the center. There nearly all the leaves were stripped from the standing beech, birch, alder, and other deciduous trees, while even the pines were shorn of their needles. Had we come upon it unexpectedly, we probably would have considered it a rather peculiar windfall, the work of a miniature tornado, a condition occasionally encountered in forest regions. But this, I felt certain, was not the effect of wind. So we searched for more definite clews as to what had been the possible cause, but found nothing enlightening. Presently Barry and I gathered together, mute questioning in each other's eyes.

"Well! how about your ballast dumping now," I asked. "Did you find any evidence of water, sand, or anything to substantiate that theory?" He shook his head.

"I'm still guessing," he answered. "Mighty peculiar; isn't it?" Jules joined us and the three of us sat down on a fallen log.

"Looks as though someone in this neck of the woods has put over something new," he continued; "taking into account the fish, this wreckage, and your statement that it did not look like an ordinary plane or dirigible."

"As far as I could make out, it bore very little resemblance to the conventional types," I reiterated again. "It seemed to be almost flat on the bottom without any apparent underworks, or any discernable wings. Instead of the familiar cylindrical cigar shape it appeared to be only half of it—something like the semi-rigid type if sliced through the

horizontal middle from end to end—rather blunt and thick near the bow and tapering to the stern. If it had motors, their sound was drowned by the commotion on the surface. And it sure could travel some.

"Let's see if we can estimate the speed. We'll say the lake is a mile wide along the course it came. I believe it took no more than eight or ten seconds to cross. Taking the latter estimate, it would make about six miles per minute, or three hundred and sixty miles per hour—a speed impossible with the present dirigibles. It might be some new form of plane using a flat undersurface instead of wings, but I haven't heard of any developed along that line."

"You've never heard of one that leaves a trail like a herd of elephants on a stampede either; have you?" Barry came back. "So we'll concede the oddity of shape as being no more unusual than the rest of it."

Then he went on to say that practically all the stories of amazing discoveries and inventions usually had for their inception isolated settings like our then present surroundings. Perhaps someone had made a fact of fiction, even though it did not appear logical, and had established headquarters in that neighborhood. I suggested it might not be a bad idea to pay him or them a visit and see what it was all about. All we had to do was follow the road.

"You mean to try to find it?" he asked.

"Sure; why not?" I answered. "It isn't often that you find something as unusual as this to pique your imagination and curiosity and at the same time have nothing to prevent trying to satisfy it. I am willing to sacrifice a few days' fishing to find out a little more about this!"

"Yea! but figure out how far you might have to go to find out anything," he replied, "if, according to your computations, it was travelling six miles a minute. A hundred miles is quite a stretch in this country and that would mean about seventeen minutes flight. Heck, it could easily be over 2000 miles away by this time!"

To Go Or Not

BUT I argued. I'd had a feeling ever since I saw it that it was descending. It seemed quite a bit lower when it disappeared behind the sky-line; but it had all happened so suddenly and unexpectedly that I did not have much chance for accurate observation. Nevertheless, we might be able to find some clew to show us if it did or did not by following it for a while. I asked Jules how the going was that way.

The guide had been a quiet but interested party to the discussion. It was an unfamiliar subject to him and outside the realm of his experience. But answering the question was not.

"Plenty wild," he answered. "No routes, no portage—travel on foot. Much swamp too. Better go when she freeze up, than now. I no go. Jules show where to catch the feesh, make camp, cook and dat; but hunt the fly-ship wot splash the water, kill the feesh, and break the trees, yes? NO."

And as if that settled it he got up and went back to the canoe.

"Looks like the majority rules against your motion—or rather notion," Barry announced with a smile, idly picking up a handful of leaves and pulling them apart. I was rather disappointed, as I felt the unusual phenomena warranted some investigation—even though the solution might not be realized. I was just deciding that there was nothing to prevent my following it up for a day or two without them, when I noticed that Barry was closely examining something that had caught his attention. He went a little distance along the trail and picked up some more leaves and scrutinized them. Then he went to the outside and did the same.

Wondering what it was about, I picked up some myself and looked them over. They seemed somewhat shriveled in appearance and very brittle to the touch. He came over.

"See what I see?" he asked. "If you don't, hold them up to the light."

I did so, and gave a start. They appeared almost transparent. Close examination disclosed that this was caused by an infinite number of minute perforations so small as to be almost individually indistinguishable but so numerous that each leaf was merely a lace-like filigree of its normal outlines. Even the stems and twigs were literally shot full of holes. I picked up a branch as thick as my arm and broke it over my knee as though it were punk. Our eyes questioned each other.

"Those outside the trail are OK!" Barry stated. "Looks like something more than merely unusual was pulled off here," he admitted. "I'm for the investigation. When do we start?"

CHAPTER III

The Perforated Trail

HERE Crawford interrupted his recital by going to his overcoat and returning with a fair-sized tin-box.

"I am going to ask you, Mr. Stewart, if you noticed any similar peculiarities in the remnants of vegetation in that New Guinea trail?"

"I can't say that we did," Stewart replied. "But I would not be justified in saying that there might not have been. Decay is very rapid in the tropics. All the evidence of a previous jungle growth along that trail that we encountered were patches and mounds of crumbling dry rot still bearing a faint outline of trees and logs. We made a chemical analysis of some of it, but could find no cause for the rapid decay existing along that narrow strip."

"You were there just about a year ago, according to your statement this afternoon; that was about seven months after our experience. No! I guess there wouldn't have been much left then. I am going to show you a sample of what you probably would have found had you been there about six months earlier."

He opened the tin box and disclosed a piece of branch, some twigs and leaves nestling in a cotton swathing, and a magnifying glass at one end. Cautioning care in handling he passed them over. Stewart examined them intensively. He finally pinched off a small piece of the branch and powdered it in the palm of his hand. He sat staring at it for some time.

"There appears to be a similarity between this and that which we found," he admitted frankly. "And it is not unreasonable to suppose that the cause might have been identical. But that it should have been restricted to a narrow path in so widely separated locations is quite bewildering — unless your strange flyer made New Guinea while you were searching for it up there."

"Not that one," Crawford replied. "I'm quite sure it did not get there. But there were possibly two others. One of those did."

Then Crawford continued.

* * * * *

Well, when Barry indicated his willingness to join in on an investigation I was much pleased. We decided to start as soon as we could get back to camp and make preparations for a few days' hike. Also, to try to induce the guide to go along. We reasoned that he was a bit scared because we showed our own bewilderment. If we could convince him that there was nothing abnormal in this and used a little diplomacy, we probably could get him to go. So we concocted a tale of a newly discovered synthetic motor fuel of exceptional power but of a highly corrosive effect on all organic substances, which the strange craft was undoubtedly using; that they were in trouble and found it necessary to dump the fuel tanks which caused all the havoc. They had probably crashed and were in need of assistance, injured or killed, and it was our duty to render whatever help we could. We recounted this as we paddled back to camp and by the time we reached it, the guide had changed his mind.

"That a boy, Jules," Barry had answered. "We knew you were no piker."

The day had dawned cloudy and by the time we were on our way, it looked very much like rain. We had little difficulty at first in following the trail as it was so plainly marked and ran in an almost bee-line in a northwesterly direction. Later in the day the going became more troublesome and we had to make some detours to avoid swamps and small lakes, but were always able to pick up the perforated path on the opposite side. Toward evening the murky sky drew in closer and a fine drizzle began to fall. We decided it was time to camp and selected the first likely spot, on the shore of a small lake. We had brought our tent fly for a shelter and while the others were busy erecting that and making a fire, I unlimbered my tackle and caught several nice bass. These, with some of our stores, furnished a plentiful meal. Barry and I were both pretty tired, being unaccustomed to long marches with a heavy pack on our backs.

The rain had soon put out the fire, we were rather cramped in our shelter and about the only thing left to do was to roll in our blankets and go to sleep.

The morning brought anything but a cheerful aspect. The drizzling rain still continued and everything above and below was sopping wet. We held a consultation to decide whether to proceed or remain until the weather cleared. Our supplies were sufficient for about six days, figuring to augment them with a regular catch of fish. Jules had brought his rifle, but, as it was the closed season for most game, we couldn't count much on that except in an extremity. To idle a day meant much distance lost and so far we had seen no indications that we were any nearer our objective. Besides, the prospect of sitting still in the chill dampness without even a fire did not appeal at all. The decision was to go on. We managed a breakfast fire and a cup apiece of steaming coffee made us all feel better.

Hard Going

THE going that day was anything but easy, in fact, it became even hazardous. The underbrush was very thick and we had to keep right in the trail for the most part, continually tramping over a mass of sodden, slippery, and crumbling boughs and branches. We had soon learned to avoid stepping on the larger limbs and even such fallen trunks as lay across our path, for one's foot sank into them as though they were rotted shells. And then we had to be constantly alert to avoid being caught under falling branches and even trees which, weighted by the rain, crashed at frequent intervals along our path.

On our way we had picked up a number of birds, one a large crane, a couple of rabbits and other creatures of the wilds. Their bodies were soft and granulous and readily fell apart when touched. Apparently they had met instant death, for one of the rabbits was still sitting on his haunches in a very life-like posture.

Luckily we had a pocket compass, otherwise we would have been unable to tell our direction; and about noon it showed the course was changing some, bearing more to the north. By this time we were thoroughly drenched and my pack felt like a bushel of coal across my shoulders. The wet tent must have added quite a weight to Jules' load but he did not seem to mind it much. We did not bother to detour for ordinary creeks and sloughs encountered, but waded through them, figuring that we could not get much wetter than we were. And so we kept on through the interminable misty drizzle, slipping, sloshing, and splashing on our way.

Finally, the underbrush began to thin out and ahead of us we noted a pine clad ridge transversing our course. As our watches showed it was near sunset, the prospect of solid ground and camp put a little life in my aching limbs. Once there, Barry and I flopped down and, I suppose, had we been alone, would have remained there throughout the night. We must have dozed there in the rain, for

it seemed but a few minutes when I was conscious of someone shaking me. I looked up and saw Jules, a compassionate grin on his face, motioning us to get up.

"Come," he said. "I show you better place to sleep. And maybe eat first—yes?"

Good old Jules! He had the tent pitched beneath the overhanging bank of a little gully, a fire was sputtering, the bacon was sizzling, and the coffee-can steaming. We ate, hung up our wet clothes to dry, Barry and I rolled in our blankets and slept while the guide kept the fire going.

The third morning of our search was as dismal and gloomy as the preceding two, only the steady downpour had given place to intermittent showers. Before striking camp, we made a preliminary investigation, going along the ridge until we picked up the now familiar trail and following it across its width of about half a mile. Here the higher ground sloped sharply and before us, apparently, was a low level plain stretching ahead and to either side as far as the low visibility permitted us to see. Out into this plain the trail continued and a checking with the compass showed the course to have passed due north and now bearing toward the east.

"Well, well!" Barry exclaimed, voicing my sentiments. "It looks as if we were out of the woods at last and will have better going. Frankly, I don't think I'd care to put in another day like yesterday —not the way my legs feel this morning. If only this darn weather would clear up and we could see the sun again and get dried out once. Looks like there's a long stretch of flat country ahead of us and, if those boys we're chasing were looking for a landing place, that ought to be it."

"Fine," I agreed. "Maybe we'll find out something now."

The guide, who had been intently studying the lay of the land a little distance apart, now come over. He gave us an enigmatic smile and a shrug of the shoulders.

"Find out much here, yes," he answered. "Over there find nothing. This all big muskrat swamp—no can cross." He finished with a comprehensive wave of his arm that included all the flat country we were overlooking.

Further questioning brought out that the swamp was all of twenty miles in length, east and west, and nearly half as wide at some places. We were then, approximately, at the center of the southern side. The ridge extended along the southern shore to the east and gradually flattened out; to the west it circled that end of the swamp, ending in a rather hilly and rough country toward the northwest.

Our hopes sank to a very low ebb. Supposing the strange craft had landed in the swamp, what chance was there of reaching it or rendering assistance to its crew? And then the mystery of its passage must remain unsolved. Only when winter's icy breath had frozen the surface would it be possible to traverse and explore this morass; and by then it would, no doubt, have long sunk from sight.

But there still remained the chance that it had crossed and of that we could make certain if we found the trail on the other side. And that meant at least one day if not more, of hard going to determine. Another shower came on and we decided to return to camp and talk the situation over in comparative comfort.

We summed up the situation in this wise.

We had come quite a ways with considerable difficulty and effort and we'd have that also on the way back. To return without even a clue would, to say the least, be disappointing. Perhaps another day or two would enable us to find that clue. I, at least, wanted to see if the trail came out on the other side. Barry suggested there might be an island where they could land and have their headquarters; also that it involved some new discovery particularly adapted to national defense, hence the secrecy. In that case our inquisitiveness might not be at all welcome. In fact, it might be wise to use a little circumspection. In trying to unravel something that others were very anxious to keep secret we might be doing so at some risk. The flyer simply would have to pass over us, accidentally or otherwise, and we would only be a part of its mystifying trail. But the spice of danger only added more zest to the chase. We would at least go on to the other side and then let developments decide our future course of action. There was one thing we could not overlook. We had to eat and our stores were running low. We would have to depend more on the chase and Jules' rifle.

"No worry about starve," he assured. "Plenty rabbits, squirrels, and duck, and fish in the lakes. Plenty muskrats here too," he added with a grin. We both agreed to dispense with that last item on the bill of fare.

CHAPTER IV

A Clue

ALTHOUGH there was no indication of a break in the weather and the comparative comfort and rest in camp would have been greatly appreciated, we did not desire to lose more time than necessary. We did take a few hours rest, however, and then were on our way again. Reaching the place where we had stood some time before, we momentarily stopped and looked about. Our intention was not to follow the trail where it led toward the swamp, but continue along the ridge as far as we could in circling the eastern end. On our previous visit it had appeared to me that there was a slight difference in the physical aspect of the trail, but it was still too gloomy for dependable observations. Now the visibility was somewhat better and details more manifest.

Though still clearly defined, there did not seem to be as much wreckage as in the earlier stages and this was composed of smaller branches and boughs, the larger limbs seemingly having escaped. I picked up a few and noticed they did not crumble quite as readily. Barry, too, was making similar tests.

"Looks like they were losing or shutting off the power; don't it?" he suggested.

"It does," I agreed. "And if they're not out there with the muskrats we might get a peek at them after all."

We followed the ridge for some hours and then changed to the north, coming in closer to the edge of the swamp. Another hour or so and we saw small sheets of open water ahead. On the chance of his getting a stray duck or two we let Jules go ahead and reconnoiter. Presently we heard the crack of his rifle and saw his arm waving above the shoulder-high reeds and rushes.

"Duck soup," we both ejaculated when we noticed a bird dangling from his hand; but we soon saw it was only a coot, or mud hen.

"Oh, well," Barry commented. "They're better than muskrats anyhow. I've eaten them when I wasn't half so hungry as—Say, look over there," he broke off, pointing across the water. "If my eyes don't deceive me, there's an old acquaintance."

Following his direction I noticed a broad lane extending from the edge of the pond-like expanse through the coarse vegetation. We lost no time in getting to the opposite side. Sure enough, there was no mistaking the peculiar characteristics of the trail.

The perforation effect was plainly noticeable in the broader grasses, the reeds and rushes, and they were all flattened out as though some great prehistoric monster had dragged its ungainly weight through them; and they crumbled like chaff in the hand.

Here was another complication—what direction was the craft traveling in when it passed this spot? Did it make a sharp turn over the swamp and pass out here, or a larger circle and re-enter? If the latter then it was useless to follow it on land, and the other way we could not. We took a three-point bearing spaced about a quarter mile apart, made a rough calculation and concluded that the circle theory was more logical and that again the way led into the swamp. Also if our projected course was anywhere near the actual one then the trail would emerge way over on the northwest end —if it emerged at all.

There was nothing left but to retrace our steps, and though the new turn in events was rather unexpected, yet we were not disheartened, for, if we were correct in our surmise of the big circle, a forced landing was not immediately imperative. If they were looking for a likely spot to land, this stretch of flat terrain, from aloft, would appear just the place. Going at a pretty good clip, they might have decided to slack up and have a better look and then found it was not what they wanted at all. But what was more natural to suppose that being all set to land they did so at the first opportunity.

The afternoon was nearly gone when we reached our previous campsite and decided to again use the same sheltered spot. The coot was the principal contributor to the evening meal, supplemented by a plant that grew hereabouts which, when boiled, tasted something like spinach.

The next day was spent in following the ridge in the opposite direction; and for the first time since we had started we saw the sun. Intermittently, at first, as the clouds thinned out, gradually, and by sunset the sky was clear. By that time we had rounded the southwestern end of the swamp and entered a rough, broken country, interspersed with gullies, ravines, and pine clad bluffs. Another night in camp with squirrel and young rabbit and more of the wild spinach for the evening meal. That night the moon shone brightly through the tops of the pines as they gently sighed in a warming southern breeze.

Getting Closer

THE morning dawned bright and pleasant with every indication of warmer weather, which, after the incessant rain and coolness, was very welcome to us. We got an early start and soon found it advisable to follow the higher ground a half mile or so from the swamp to avoid frequent sloughs extending into the gullies and the almost impassable underbrush that fringed its margin. We expected no difficulty in re-locating the trail if it intersected our path, as it had heretofore been so clearly defined; but after the morning had passed and we found we were along the north side and headed east without having seen any of the familiar indications, we began to feel that something was wrong. Perhaps it was in our calculations, or the craft had made a sharper turn, or had, after all, dropped in the swamp or had landed between it and our course.

We selected the latter contingency as being the one which demanded first attention. There was no wisdom in going on unless we were sure we had not passed by the object of our search. After a light lunch we zoned out quarter mile stretches of our back trail for each to examine, with instructions to penetrate to the swamp wherever possible and to meet again at a designated spot.

Three times we met without result and Barry and I were awaiting the overdue guide at the fourth zone when he suddenly emerged from the brush. We sensed a difference from his usual lethargic manner and before we could utter a word he began nodding his head. We were pretty well excited, you can imagine, and plied him with questions. We learned that he had found the trail but not that which had made it.

"The big slough it go this way; the trail she go that way. Can't get over. We go around this way and find him on other side, yes?" He indicated the directions with expressive waves of his arms.

"Well, Joe," said Barry, "it looks as though we have caught up with the chase at last. It must be somewhere between us and the swamp, if it didn't go straight up, or vanish entirely. Since we have gone to a lot of trouble to get a peep at the thing, let's get it."

CHAPTER V

What They Found

FROM a bluff on the southern side we were silently gazing down into a small valley nearly enclosed by a horse-shoe shaped continuation of the ridge. Near the center we were able to make out a squat, shuttle shaped object that undoubtedly was the flyer we had been so arduously trailing the past five days. Our attention at first was centered on its immediate surroundings as much as on the craft itself. The floor of the valley had been thickly overgrown but now, excepting a fringe along the ridge, nearly every plant, bush, or tree was twisted and broken, leveled and crushed to earth. Even the soil itself was furrowed and torn by some cataclysmic force. It was as if a terrible explosion had followed the landing and we expected to see a shattered hull. But no outward appearance of damage to its symmetrical outlines was discernible, nor was there any bit of wreckage that might have been a part. Apparently it had landed as gently as a gull settles on the waves.

We searched about for some sign of the occupants, but no trace of any was to be seen, at least from where we were. After some minutes we began circling along the ridge, advancing where screening permitted for further observation. This we did until we reached the opposite side. Still no trace of the crew was evident. Either they had left the vicinity or were still inside.

We now had a good look at all sides of the strange craft and wondered at its peculiar outlines. Had we unexpectedly come upon it we might have believed we had happened upon another "Lost World" and taken it for some monster pre-historic turtle-shaped amphibian that had just crawled up from the slime of the swamp. Of a certainty we wouldn't have tolerated the thought that it was capable of traversing the air at all, much less that it did so more efficiently and at greater speed than anything we knew of.

The general dimensions were about fifty feet in overall length, twenty feet at the widest point and fifteen at the greatest heighth. The top was rounded, the highest part or crown being nearer the end that lay toward the west. At that end was a rounded protuberance extending five or six feet which we had noticed while circling and took to be a sort of observation post, naturally concluding that to be the front.

On the sides the top flattened out into thick scalloped webs extending practically the entire length but merging in a streamline at both ends. The points of the scallops were drawn out to varying lengths, each ending in a round cap and resting against the side at an angle having the appearance of shores or fenders as seen on ships making dock. The front end was rather blunt, and the protuberance, I mentioned before, stuck out not unlike a turtle's head; the rear tapered gracefully and symmetrically to a point. The general color was a bluish slate, changing to a pale orange along the edge of the webs, while the rounded ends of the angular extensions were a transparent yellow. By contrast the crown was a large jet black oval that covered nearly a third of the area of the entire top; the protuberance was of alternating concentric rings of black and yellow. Behind and above the latter was a projecting knob of the general body color and comparatively inconspicuous. What was below the webs was hidden by the dangling projections and the scattered wreckage of trees and bushes.

"Well! What do you make of it?" Barry questioned in a low voice after we had been watching it for some time.

"Name it and it's yours," I returned. "It's got me. What do you say to going in closer? Seems as if no one's about—unless they're inside."

He agreed, and leaving Jules and our cumbersome packs behind we cautiously approached the rear end.

"I don't know what to think of all this," Barry whispered, as we were picking our way through the wreckage with as little disturbance as possible. "They're sure able to level out a landing place. They've got *something* I'm not anxious to have turned in my direction. Let's see if this wreckage has the same characteristics as the trail."

We made an examination and found that it had; and from the shred-like remains of leaves and crumbling brittleness of branches and limbs, judged that here the strange force was used to a much greater extent than we had noted elsewhere. We reached and stood under the torpedo shaped stern and then could see that the underpart rounded and narrowed like the hull of a ship, but, instead of terminating in a keel in the center, there were two, separated by several feet with a rising arch between them.

We gingerly ran our fingers over the covering or sheathing and found it glassy smooth and hard, cold as steel and yet with an unmetallic feel. It was not continuous but consisted of innumerable diamond shaped plates of varying size perfectly joined. We flattened our ears against the side, listening for some sound from within. I thought I could detect a very faint humming or throbbing but wasn't sure but what it might be due to the closed ear. I suggested we take opposite sides and make our way toward the bow. With a gesture suggesting caution Barry disappeared around to the left.

A few steps and I had reached the rearmost of the angular extensions and stopped to examine it. It depended from the overhanging web, the end a good yard from the ground which it would nearly reach when not drawn up. The web here was above my head and I could see that it sloped higher toward the front.

The drooping arm was elliptical in section, an arm's length wide and half as thick, terminating in the nearly circular knob. Upon this I had centered most of my attention, feeling certain that from it the strange and powerful force issued. A

seemingly hard, horny, semi-transparent convex substance not unlike a lens, covered the end. A furtive sideways glance into it did not reveal much, for the pale yellow coloring effectually obstructed vision.

Realizing that this device was undoubtedly mobile and adjustable to various positions, I undertook to learn by what form of mechanism it was operated. It was then that a surmise that somehow or other had persisted in the background of my mind, but which seemed entirely too absurd to warrant consideration began to assert itself.

Puzzled

SURELY, if these extensions, projections or whatever they might be called, were movable, and of that I had no doubt, then no hand of man *ever* fashioned a connection such as was here used. No joints or pivots were visible, just a merging of one to the other with an expansion of the covering on one side and contraction on the other. Either Nature had been simulated to the last degree—or Nature herself had been the builder. And if the latter—then this was no super man-made inanimate aircraft developed and built in secrecy, *but a sentiate, living monstrosity* possessed of unaccountable, mysterious powers of whose counterpart there was no existing knowledge in the annals of terrestial creation. That this could be true seemed entirely too unreasonable for belief; and yet the presentiment persisted that it was a fact.

A slight crackling from the other side gave me a momentary start, and I was ready then and there to leave that vicinity without further notice. But the supposition that it was probably Barry, continuing his investigation without a full realization of the precariousness of our situation, held me. Wishing to substantiate my feeling, if possible, and also to acquaint and warn him, I continued toward the front, on the alert for any observable movement.

A glance here and there underneath disclosed that it was resting on projections like the teeth of a huge rack with thick horny protection on the bottom. These underparts were a greenish white, heavily scaled and decidedly reptilian in appearance.

I counted six of the arms or fins or what-nots on my side each somewhat longer than the one just passed. But the foremost was of exceptional length, so much so that it overlapped by half the neighboring one.

Just then Barry appeared around the front with such an expression of utter amazement and bewilderment as I had never seen before on his face.

"Come on," he whispered as he pulled my arm. "We'd better get away from here—right now."

We returned to the higher ground and selected a spot for our camp where we could keep the little valley and its strange occupant under observation without ourselves being too conspicuous. While Jules was pitching the tent and preparing a meal we sat down at the edge of the bluff in silent contemplation.

"Barry," I finally remarked, "if you tell me you think as I do I'll say you're crazy."

"Well, Old Scout," he replied with one of those serious glances over the rims of his glasses. "I rather believe we're both pretty much cuckoo then. But in all seriousness, Joe, that thing out there is no hand-made or factory-built flying machine. which, I take it, is your own conclusion. But what in heaven's name is it, and where did it come from? It's alive—or was when it landed here. Some pep, too, I'll say, when feeling right. We've had a deuce of a time finding it but it's going to be a whole lot harder classifying it."

"We suspected something unusual, or we would-not have come," I replied: "But it looks as though our expectations have been considerably exceeded. Why, it's preposterous to believe that creatures such as this could have eluded discovery living in this or any similar swamp only comparatively isolated. If this were in the unknown wilds of Africa or South America, it might be a tenable supposition; but here within arms' reach of the civilization of North America, it's past belief!"

We sat there theorizing and commenting. That it was neither bird, beast, reptile, or insect, we agreed, although it possessed some attributes of each and all. Also that it was a creature whose like had never been mentioned either in fact or fable to our knowledge. Where did it come from and why was it here? Even supposing that it was an inhabitant of some jungle fastness in one of the few regions yet unexplored, its phenomenal powers of flight, evidenced by its presence here, precluded the possibility of its remaining undiscovered up to this time. Since we could only reconcile ourselves to the belief that some trace must have been found —somewhere—if this monstrosity was really a contemporary inhabitant of our earth, we were forced to the seemingly more preposterous one that it was *not* of our world at all.

Somewhat jokingly we at first voiced this opinion, but soon saw that we were only camouflaging our true feelings. Thereafter in all seriousness we sought to analyze the situation from that point of view.

We were brought back to earth, as it were, by Jules who had quietly come up behind us.

"Some funny airship," he observed with a questioning glance at us. "She more like a big bug, yes? You come eat now, yes?"

"Might as well," Barry answered. "My mind's all in a blue funk anyhow."

CHAPTER VI

Contemplation and Conjectures

"JOE, what are we going to do about this?"

It was Barry, who reopened the discussion after we had returned to our observation post on the ledge. The long northern twilight was merging into dusk and the little valley lay ringed in somber shadows under a lemon canopy of sky. Frogs were croaking in the marsh, fireflies twink-

ling in the lowlands and pesky mosquitoes, brought to life by the day's warmth, persistently followed their usual occupation.

Under these normal and prosaic conditions it was hard to believe that out there only distinguishable as a lighter colored mound, was an object entirely abnormal and foreign to these surroundings.

"One thing I'd like to know to start with," I answered, "and that is if there's any life left in it. If we were certain there was not we could make a thorough examination and arrange for one of us to return and announce our find, while the others remained on guard."

"Say! Can you fancy the excitement it will make? I can see planes buzzing around here as thick as these mosquitoes are now, bringing reporters, professors and scientists."

"Maybe," he interposed. "Do you suppose you could get anyone to believe such a tale without some pretty convincing evidence? They'd all think you were gone bughouse, and I don't see as I could blame them."

"Oh, I don't know," I returned. "As far as evidence is concerned I think we can take care of that. I've got the little old Kodak in my pack and I don't think any of that excessive moisture we encountered lately got to the films."

"Gee! Did you really bring it?" he enthusiastically exclaimed. "That will certainly help a lot. That gives us a plan of action. Our first move will be to get some pictures in the morning, and then see if an inquest is in order, for we wouldn't want this 'bird' to fly away while we are doing our advertising, leaving us, apparently, the perpetrators of a most colossal hoax. But why didn't you use the camera this afternoon?" he asked.

"Gosh, I was too astonished and excited to think of it," I replied. "But how are we going to find out if it's dead or alive—tickle it in the ribs—say 'scat' or what?"

"Your levity is not as senseless as it sounds," he retorted. "How about tickling it with a bullet or two?"

That sounded all right to determine the question. But supposing it didn't like that kind of a test and started for home—wherever that was. Then we'd be out of luck. On the other hand we couldn't induce or compel it to stay anyhow if it decided to take leave. It would have taken at least two weeks before we could expect any of the right people out here and there was small chance that it would be so obliging as to hang around that long if it could help it.

Besides, as Barry aptly expressed it, "There's no hotel or even delicatessen around here," we were likely to run pretty shy on eats in a few days. So we thought it advisable to make whatever investigations we could first and then settle if it were alive or dead.

"Perhaps it's nocturnal in its habits," I suggested. "Supposing we stand watch tonight and see if anything happens."

It was midnight when I relieved Barry at the post.

"Anything doing," I asked.

"Haven't heard a thing out of the ordinary," he answered, "and, of course, couldn't see anything in this stygian darkness. You will have an advantage, for the moon will soon be high enough to light things up down there. You can serve as a change of diet for these pesky mosquitoes—I'm as full of holes as that trail we followed."

Then followed a period of "watchful waiting" and continual smoking while a lop-sided moon crept above the tops of the encircling pines. Before long its light fell full upon the strange creature and was reflected in scintillating lines of radiance as though it were an enormous jewel lying on its black velvet bed.

I had ample time for contemplation and strange conjectures. Could it really be that a being from some other world had happened here, I asked myself. If so, it was the first instance known to mankind. Or was it? I recalled reading every now and then some press items of strange aircraft having been seen to pass where none were known to be. And some of these tales even antedated by years the period of practical flight. Perhaps there was really a background of fact in support of these observers whom we so willingly and contemptously credited with pipe dreams. And then, what of the tales of winged fire-breathing dragons and other fabled creatures for whose invention no logical counterpart has ever existed, to our knowledge, among the vast, diversified host of earthly fauna?

If this one could traverse space and reach our little globe was it not logical to assume that others might have been able to do the same? The lack of actual confirmation presumed that such was a very infrequent occurrence. Perhaps it is our gravitational force, our atmosphere, with its attributes of pressure and resistance, or our temperature or other terrestial peculiarities that are unsuitable and hindered more frequent visits.

Further Investigation

OUR atmosphere should of itself be no deterrent to anything capable of traversing the emptiness of interplanetary or stellar space; its pressure, however, could be harmful to an organism not adapted thereto; and its resistance undoubtedly so, if traveled at great speed. As for temperature, cold could seemingly be disregarded for there is hardly a comparison with that which is attributed to outer space; though sufficient to preclude the alternative of excessive heat. Still these forces and conditions, though in all probability contributing factors, did not of themselves appear to constitute an impenetrable barrier to previous landings. No doubt there were others that must be considered, but their identity could only be determined by a better understanding of the visitor.

Was it a larger or smaller world from which it had come? Its size and apparent weight fostered belief that it would hardly be a larger sphere.

Certainly it could not be from giants like Jupiter or Saturn, for it would require an enormous expenditure of force to overcome their attraction. Mars or Venus appeared more likely since conditions there more nearly approximate our own. But allowing a similarity of conditions then why not more frequent visits? Well, it was a puzzle all right.

A flash, apparently the reflection of the moonlight on some mirror-like object, caught my eye and aroused me from my meditation. I fancied I saw something moving on top and near the front of the creature, something that was slowly rising and swaying back and forth. I strained my eyes to make sure, but the harder I looked the more they blurred in the indistinct light. The most I could make out was something long and slender with an enlargement at the end, something that resembled a long arm with a big fist or knob on the end.

As I watched it seemed to slowly turn and like the flash from a lighthouse, a greenish-red phosphorescent disc, the size of the knob came into view and was gone. I expected a further movement or at least a repetition of the flash but the extension appeared motionless thereafter. Then I must have dozed for of a sudden I noticed it was daylight. Everything looked just as it had the evening before —I couldn't see anything to which the movement observed during the night might be attributed; and later when I acquainted Barry and he seemed rather skeptical I began to have some doubts about it myself.

Following our prearranged plan, as soon as the light was right, we took a number of snap-shots from different points of vantage. As the sky was cloudless and the bright sunshine flooded the little valley, we felt sure of getting some good pictures. Then we were ready to determine if a closer inspection might be safely attempted.

We borrowed the guide's rifle and a few of the remaining cartridges and took our stand on the ledge. By this time Jules had his own opinions regarding this "airship" and the ledge was as close as he cared to venture. We might as well have used a bean-shooter for all the effect the twenty-two's produced. They merely glanced off and went singing among the trees on the other side. Somewhat encouraged by lack of response we went closer and began throwing stones at it. It makes me smile when I think of the incongruity of the spectacle we presented. There we were a couple of practically unarmed mortals throwing stones at a fifty-foot monster of unknown temperament, but amazing power. All that was lacking were fur pants and a movie camera to make a perfect setting for a cave-man thriller.

We tried to avoid hitting what we considered vulnerable spots, as we had no intention to harm it if still alive and arouse it to possible fury or sail away. We only attempted to determine if a moderate disturbance was likely to produce some movement or action making it unsafe to venture closer. As nothing happened we gradually closed in until we were again beside the overhanging rear. For a final test we gave it a few smart raps with a fair-sized club.

"Well, if it ain't done for, it's mighty lazy," Barry commented, as he wiped the perspiration from his face and glasses, for the day was becoming increasingly hot, and there in the glen the sun beat down mercilessly. We figured there wouldn't be any great risk inspecting it, if we went about it quietly.

However, as we went along examining and commenting about this and that feature, we gradually and unconsciously began to lose our excessive caution. From the ground we could not observe much more than we had the previous day, though we took our time in noting the various peculiarities. Together we looked into the lens-like end of one of the annular arms, and wondered what mysterious force it was that could sustain and propel so great a bulk and cause such unwonted terrestial havoc and how it was produced.

"I'd like to get a close-up of that big oval on top there," Barry remarked; "and then that appendage up in front to see if it is nose, mouth, eye, or what have you. Think we can make it?"

I thought we could but remarked that the going up might be a whole lot safer than the coming down.

"Oh, bosh," he replied. "This thing hasn't twitched a muscle or its substitute since we got here. It's just like an overgrown turtle, ready to pull into its shell and wait until the excitement's over. It's probably as dead as King Tut's sacred Ibis."

We made a sort of scaling ladder by trimming a suitable sized spruce, leaving stubs of branches for runga. His insistance that as suggestor he was entitled to priority won his point and while I steadied the makeshift ladder he carefully ascended, after first removing his shoes. A few preliminary test steps to which no reaction followed and he disappeared over the edge. I stepped out to where I could see him. He was on all fours at the edge of the oval, his head and shoulders swaying as though trying to encompass in one glance some action or disturbance occurring throughout its extent.

For several minutes he was thus engrossed, when catching sight of me over his shoulder he motioned me to come up. Also shoeless I climbed the sapling as he steadied it from above.

"What is it," I questioned.

"Go up and look," was his only response.

On hands and feet I crept up the sloping back, noticing that despite the hot sun it felt cold and clammy. At first I saw nothing so peculiar in the large shining black oval except the oddity of its contrast with the rest of the surface; but soon I did not wonder at Barry's rapt attention.

As I looked more intently I became aware of lambent vibrating rings of color, of flickering rainbows seemingly cascading in endless flowing streams. The entire oval was apparently as black as tar but all the colors that are ordinarily dead in that substance were here in living form.

Now I knew the reason for his peculiar action.

I unconsciously did the same, trying to unravel the workings of the marvelous chromatic kaleidoscope. After some minutes I began to get an understanding of its general design.

A hard, horny, transparent covering an inch or so thick, covered the oval, as the crystal of a watch covers its face. Beneath this crystal were numerous alternating concentric rings composed of triangular pyramids and radial corrugations.

The Living Rainbow

BOTH pyramids and corrugations varied proportionally in size; the former from scarce an eighth inch in base line at the top of the crown to a full three-quarters near the edge; the latter from mere lines to quarter-inch tubes.

The pyramids, black as though made of polished jet, were arranged with interlocking bases in double rows; and filmy flames of iridescent colors traversed their sides. The radial bands, only half the width of those of the pyramids, seemed nearly transparent and appeared to be a connecting medium or circuit for the latter. The narrower and finer bands, those surrounding the apex, were practically colorless, only a black sheen emanating therefrom. But almost imperceptibly this changed to a light purplish tint and this, as it passed through each succeeding pyramidal ring, was intensified until it became a deep violet, then fading merged into the various shades of indigo, then of blue, green, yellow, orange and red, until the red merged into a dull rosy glow, disappearing in transparent pulsations in those bands near the edge.

Imagine a huge oval opal in the interior of which the fires of an endless living rainbow are imprisoned; in which the flames of multi-shaded colors flow and stream and yet never pass; and, interposed with the merging and intermingling shades of red, orange, yellow, green, blue, indigo, and violet, annular bands of myriad diamond points, each facet in itself a miniature of the whole—then you may gain some conception of the wonderfully beautiful organogency on the back of that ungainly monstrosity.

"What do you think of that; pretty nifty, eh?" Barry inquired as he joined me for another look. "Glow worms and fireflies compare with this like a candle with a desert sunset; only this is optically much weaker—you've got to get close to see it."

"Looks to me as though the functions were for producing directly opposite effects," I answered. "Your bug or worm converts energy into luminescence; apparently this converts luminescence into energy."

"You're on, Joe," he agreed. "That is a compounding spectroscope with an Nth power—a short wave converter that we poor mortals haven't even imagined yet—a color screen that would make a rainbow jealous. I think I can make a pretty good guess now where this 'baby' gets its power."

"You mean sunlight, I suppose," I answered. "That's going back directly to the ultimate source of energy. That seems to imply that its natural environment would be somewhat similar to terrestrial conditions—probably more but not less solar radiation. Then one might presume that its habitat would be on a neighboring planet and not the more distant ones."

"Not necessarily," he replied. "You're probably overlooking the fact that the earth's atmospheric envelope offers quite a resistance or obstacle to certain rays; perhaps curtains some altogether. If our Heaviside layer can deflect radio-waves back to earth, why couldn't it obstruct or deflect certain incoming waves as well? Then a planet, unburdened with such a hindrance, though it received far less light and heat, might yet receive a much greater volume of those rays than we do; Mars a little more, Mercury too much, Jupiter and Saturn doubtful from a habitable standpoint on account of their supposed plastic state—so we may have to go to Uranus or Neptune—maybe even to some other solar system."

While Barry was talking I used my hands to shade the various spots to better use the color display. It seemed that where the direct sunlight was obstructed, there was a wavering, a fading of intensity in the flowing streams. Using my cap to provide a larger screen I found it practically obliterated the display beneath. Bringing it to his attention, for some moments we both were busy shoving our caps here and there. So engrossed had we been in our examination of this extraordinary structure that we practically forgot our situation. I began to realize, at length, that this display would hardly be taking place if the creature were entirely lifeless. Then we plainly heard a shout and turned to see from whence it came.

CHAPTER VII

A Pantomime Conversation

NOW I suppose I should say that our eyes stared in horror and our hair stood on end with fright; but I can't exactly recall just what my sensations were. I know I stared all right and think I felt more foolish than frightened, at first, though, I'll admit, feeling a few near-zero shivers circulating in the spinal marrow.

For as we turned we suddenly discovered we were being watched; and what was watching us was a greenish-yellow, slightly elliptical disc set in a hood like a monk's cowl at the top of a tapering neck, longer, thicker, and rougher than an elephant's trunk—a periscopic eye, more than a foot across, motionlesaly focused and meeting our stare two yards above our heads.

"Sit still," Barry whispered.

"Don't move," I warned.

And like sculptured images we sat there scarce daring to take a breath. For minutes that seemed hours we suffered that owlish, unblinking stare, expecting we knew not what. The suspense and inaction were worse than the unexpected discovery. A cold sweat was beginning to ooze from every pore and muscles of my arms and legs began twitching

from the strain of maintaining the uncomfortable position.

"Shall we make a break for it?" I managed to mutter.

"And get turned into sponges most likely," he answered with an articulation no steadier than my own. "Hold on; maybe we can wait it out."

But he should have taken his own admonition to "hold on", for just then he slipped and in trying to recover made quite a commotion. We expected an immediate blast of some kind from that baleful eye, but it only maintained that unceasing stare.

Then suddenly the cowl-like top closed over it like a knight shutting the visor of his helmet, opened, closed, and opened a number of times. Then the peak of the cowl began to wag in varying periodic vibrations. These movements were repeated over and over in the same definite order with an intermediary and seemingly questioning stare. Finally a rhythmic swaying of the long stem-like neck was added to the other motions.

"Barry, I believe it's trying to communicate with us," I suggested.

"Looks that way," he replied; "but I can't quite make out if it's a greeting, a requiem or a request to vacate the premises."

"It may have some intelligence and is trying to find out if we have any," I continued.

"If it has it knows we haven't—or we wouldn't be here."

"Just the same," I went on; "it's no use to let it think we are dumb-bells entirely. Suppose we do a little wigwagging too—make some motions with our heads and arms."

"I'd rather make a lot with my legs and feet," he answered calmly. "But go ahead if you think it'll do any good; might as well do that as nothing."

Thereupon I began to wave my arms, slowly and cautiously at the start, and soon saw that this seemed to interest it, for the movements ceased and it returned to its fixed stare. Gaining confidence, I arose although the footing was none too secure. As I did so, I saw Jules close to the front of the creature, his rifle trained on the now motionless hood. He saw me too and his expression was easily read.

For an instant I debated in my mind. Had he been holding an elephant gun or a large calibre rifle, I might have decided differently; but his little twenty-two was nothing to take a chance on under the circumstances. I held up my hand and shook my head.

Then I began a pantomimic exhibition for the benefit of our host. I snapped the visor of my cap up and down, swayed my head and in general tried to imitate as nearly as possible the movements we had observed. This immediately brought a repetitional response.

"Joe, if you could only wiggle your ears it would help a whole lot, I think," Barry irreverently interposed. He was not trying to be funny—it was just his nature. Serious minded and countenanced he seldom cracked a smile, but underneath that reserve was a fountain of rich humor; and particularly under stress or excitement it spurted forth most unexpectedly.

I continued, but to make the exhibition more realistic, now endeavored to convey an explanation as well as an apology for our intrusion. Trying to show that, being inhabitants of this mundane sphere, we happened in the vicinity, discovered its presence and because of our inquisitive though harmless nature, endeavored to find out what it was all about. We thought there might be something interesting up here and of course had to come up to find out. Our intentions were of the best—regretted the inconvenience—sorry to disturb its rest and so forth.

The Organic Movie

IF it did not understand this at least it gave close attention for the orb never deviated from my direction.

"Fine, Joe," Barry exclaimed at the conclusion; "I could almost make out the drift of it myself."

"Oh, shut up," I returned, somewhat peeved. "Here I go trying to square things and all you do is set there and make criticisms. But, if I'm not mistaken, it's your turn now."

Obviously the stare was now transferred to his person, and as obviously one could read the implication—"Now, what have you to say?"

"I'm not much on deaf and dumb talk; but I guess I'm it," he admitted as he began a similar course of philological maneuvers.

"You chide me for criticising; do you?" he said to me. "Well, if you'd have made your pow-wow a little plainer I wouldn't need to repeat it. I'm thinking you started something; if this one-eyed, universal hybrid fancies this entertainment, we've got a steady job—as long as we can keep it up."

As he continued, his motions were interspersed with running comment, like a vaudeville juggler cracking his jokes during his act. Later I was able to appreciate the humor of the situation, but at the time it certainly was serious enough.

"If you want to see all the unwelcome emotions registered at one time—look at Jules' face," he went on. "He's a real guy at that I'm telling you—if we'd have kept our caps away from that 'aurora-borealis' this wouldn't have happened—I hope the other eye don't pop up from nowhere—Talk about equipment; this thing's got everything but wheels—Whew! But it's hot. There, I hope I've squared myself."

We anxiously awaited the result of our efforts. Soon there followed a momentary wagging of the peak and then the long periscopic affair began to telescope and shorten until the hood was but a yard above its back.

A change began to take place in the orb; a gauzy, milky film quickly overspread and displaced the greenish-yellow transparency, and on this film shadow-like spots and patches formed and flitted. Somehow their outlines and movements brought a sense of familiarity. I wondered—and then curi-

iosity again getting the better of discretion, cautiously crept close enough to get a fair view.

An involuntary cry of amazement escaped me as I realized what I was looking at; for there on that gauzy film were two figures, undeniably human, standing on a sloping surface apparently going through a form of calisthenic exercises. It took but a moment to recognize the scene.

There we were, plain as day. Barry's long, lanky form on one side, mine on the other, repeating the identical movements we had just completed. But, whereas we actually had made them in succession, they were now shown simultaneously.

The images, entirely colorless, were as plain and distinct as a photo-engraving and seemed similarly formed of high and low lights through the medium of the gauzy film.

Although the slight convexity of the orb produced a somewhat spherical field there was little distortion.

"Well, I'll be ——. What next!" I heard Barry exclaim softly and in awed tones, as he too moved closer and observed the picture. This soon began to fade out and in its place a round object began to form, gradually developing into a shining sphere wrapped in a scattered covering of fleecy wool, through which darker patches bordered by faint lines and tracings, like the cracks in old ivory, could be seen. Something led me to expect a definite outline in the arrangement of the patches and inclosing tracings and I was not disappointed.

"It's the Earth," I whispered; "and I can make out the American continents." He gave an answering gasp.

For a few minutes we watched a miniature of old mother earth swimming majestically in space, actually but a few feet from our eyes but apparently thousands of miles away. Then the hooded eyelid dropped and the peak again went through its wagging movements.

"I've got it, Joe," Barry exclaimed. "It means—that's us."

When it opened the orb again was black. But soon another image began to form, one that resolved into another sphere, also bright and shiny but devoid of any obscuring covering and seemingly of greater extent, for it covered the entire surface. The more distinct configurations soon indicated, however, that it was because of a closer view rather than a larger object that the impression of size was gained.

But this was not a true sphere, rotund as the previous one, but more of an oval; an egg-shaped combination of sphere and cone whose surface was extremely rough, deeply scarred and pitted. As we watched the image enlarged and overspread the limits of the orb and our attention necessarily concentrated on the part in view.

This was a section of the conical hemisphere, and apparently we were approaching it at a tremendous speed. Nearer and nearer we came as if on the wings of thought, and more and more distinct became the rugged outlines of the unfolding terrain.

Vast saw-tooth ranges, mountainous cliffs and spires bordered immense crater-like pits, whose depths were partly hidden in sharply-defined, inky-black shadows from the encircling elevations. It appeared as if some great and long continued bombardment of super-projectiles had caused those gigantic shell-holes—had, in fact, literally blown away the original spherical contour and altered its shape to a jagged conical mound.

Toward one of the largest of these craters our course was directed and such was its extent that before any detail of the towering rim was discernible, it overflowed the field of vision and passed out of sight. On and on we plunged and now the bottom seemed to swiftly rise to meet us. Then the speed suddenly slackened and in the airplane view spread below we began to distinguish various features.

My first impression was that we were observing some vast engineering or mining undertaking, for there certainly was a great amount of activity and movement going on. I could make out numerous forms resembling dredges or large steam-shovels apparently engaged in excavating, while a moving line of others were doing the trucking. As we came still nearer I felt sure my impression had been correct; and then we hovered for a while at a height from which the operations became quite distinct. But the nearer our apparent approach the smaller became the circular field of vision until now it seemed as though we were looking through a small hole in the floor of an elevated structure.

A Strange Undertaking

AND in that area thus disclosed, a most astounding proceeding was taking place. Some great undertaking was in progress but this was being done, not with mechanical apparatus as I had supposed, but with creatures the same as that whose cinematographic eye was now portraying the scene to us. And yet there was a certain machine-like action in their arrangement and movements.

Like huge steam-shovels, operating in recessional tiers, they were ranged side by side, hooded eye erect and looking much like a smoke-stack, evidently further enlarging the vast excavation. I centered my gaze upon a certain one to fathom, if possible, the reason for this activity as well as the methods employed in its consummation.

It stood, head on, a short distance from the terraced bank. I said head on, though really there was no distinguishable head as with terrestrial fauna; but, anyhow, the one with the rounded extension which subsequent events demonstrated to be the business end. Its two large front flippers, in constant undulatory motion, were pointed forward, their lensed ends directed at the bank from which the material just seemed to disintegrate as from a powerful hydraulic nozzle.

But this separated, pulverized material did not fall or settle to the surface; neither did it blow away in a cloud as one might expect. Instead it flowed in a faint, though discernible, slow-moving, tubular

stream, like dust motes in a beam of sunlight, toward the rounded extension about which it clustered as do filings about a magnet's pole.

This loading process apparently required some time so I shifted my gaze to one that was moving away. With a large doughnut-like shape at its front end, and a ponderous tank-like motion, it trundled along till well away from its fellows when, gently and with no more fuss than a balloon, it rose from the surface and quickly sped out of the picture. Another took its place from a waiting line.

I then noticed a pillar-like elevation on top of which was one which, by the swaying movements of its periscope, seemed to be directing and overseeing the labor of the others. For some moments more we were permitted to look upon this scene and then it too faded from view.

Then another picture formed which at first appeared to be a repetition of the other with a somewhat different setting. But as it became more distinct, it was soon evident that here a different motif was expressed. A circular eminence occupied the center of the picture in front of which a considerable number of the creatures were grouped.

Here none of the previous activity was in evidence. All were practically immobile except one which occupied a commanding position on top of the elevation and was evidently a leader in communication with the others by means of the revisualizing orb, emphasizing with much swaying and nodding.

The scene was highly illuminated as if in full sunlight; and yet, above the distant cyclorama of towering cliffs whose crests were sharply outlined against a black, velvet sky, there shone a crescent of pearly brightness, the crowning jewel in a diadem of starry diamond points. Like an oversized moon at the quarter phase, it hung in the inky sky in brilliant splendor.

That this had something to do with the strange gathering became evident by the many nods and swayings of hoods in its direction. Finally after what appeared as a sort of general obeisance, several composing a small independent group, formed in a line; and, amid a universal wagging, slowly arose from the surface and began to circle about.

And now it seemed as though we too had joined them—to all appearance we might have been riding on the back of one of them, from whence we could look down and observe the terrain below. We seemed to be climbing in constantly enlarging spirals and at increasing speed, and soon their mates below appeared no larger than beetles grouped about a small sand pile.

In a short time our radius encompassed the mountainous rim of the vast pit and others equally vast came into view; and all the time the speed was increasing at a terrific rate as the three maintained their now side-by-side formation.

Over mountain heights, above yawning chasms and across crater after crater we sped until even these flattened out in dwarfed replicas of their former awesomeness. Again the conical outline of this strange world became apparent, and with a final burst of meteor-like speed we left it behind and shot out into the black curtain of space toward the shining crescent.

Though only a moment was required to traverse the intervening distance in the picture representation, yet, as we approached, the horns of the crescent spread out over its entire surface, and again we saw before us the beaming full face of our own mother earth.

Then suddenly the hood snapped shut, the peak wagged a few times and when it again opened the gauzy film was gone and once more there was nothing but the greenish-yellow light and the blank stare.

Barry gave a soft indrawn whistle. We only looked our amazement.

"That was it," I whispered. He nodded.

We hardly had time to wonder what was next when the periscope extended to its full height and the orb was directed toward the front. Then the two front projector arms slowly swung forward. We stood up to get a better view and saw Jules sitting on a pile of brush a score of yards away and almost in line with those terrible lensea. Apparently he was unaware of the movement, for his attention was diverted to something on the ground.

Evidently misconstruing our yells and frantic motions for him to get out of range as a call for help, he did the one thing we least desired just then. Jumping up, he pumped a few quick shots at the towering eye before we could call to him to stop. Excitement probably spoiled his aim, for I don't think any made a direct hit.

But the creature seemed to have sensed something hostile in the action and resented the effrontery. Of a sudden the scattered debris near him began literally to fly to pieces; stems, branches, boughs, and soil were resolved into a swirling cloud of mottled dust that rolled before the pulverizing blast. One look and the guide was legging it at top speed for the shelter of the ridge. Over the hurdles of scattered brush he sped and at his very heels there followed an increasing, whistling tornado of shattered matter that quickly hid him from sight.

And then it dawned on us that it might not be a bad idea to get behind that ridge ourselves. We did not bother with any farewell waving or wagging but just went over the side without ever thinking about our improvised ladder. And the cloud of dust, rising in the opposite direction, at our heels, was made by our own unaided efforts.

"Damnation!" Barry gasped as we reached a safe spot to stop. "That's what comes of getting excited."

"Yes, if he only hadn't fired," I answered.

"I wasn't thinking of that," he replied, beginning to hop around on one foot. "We forgot our shoes."

CHAPTER VIII

Drastic Measures

WE made our way toward our old lookout point and peered from behind the sheltering rocks trying to find out what had happened to Jules. There was a clean swept path to the foot of the ridge, but of him there was not a trace. The creature still remained in about the same place and now seemed engaged in widening the path in its vicinity. Like time-rotted remains of its living likeness, the scattered debris crumbled at the touch of that mysterious blast and rolled in swirling clouds before it. Even the soil offered little resistance to its action and soon there was a depression of some depth.

Then followed in actuality a repetition of the excavating scene we had witnessed on our picture journey. The rounded snout-like projection began to function and a yellow circular stream of pulverized earth flowed toward it. But the action here was not as smooth or consummated with equal ease. Eddying breezes affected the operation, disrupting the loosened material and breaking the continuity of the flowing stream. Evidently some practice would be required for it to become accustomed to the unfamiliar conditions.

A rustling drew our attention behind us and there came Jules still looking somewhat scared and out of breath but otherwise apparently none the worse for his experience. We expressed our relief at his escape and commended him for his courage and fidelity. He looked from one to the other and then down into the glen. "D—— fine airship; by h—— yes," was the way he summed up his feelings.

For a while we watched the proceedings; then the powerful emissions were abruptly terminated, the lensed flippers dropped to its sides, and the hooded eye, after a close inspection of the surroundings, slowly sank until only the inconspicuous knob remained above its back. Again it had resumed its apparent comatose state. Expecting no immediate resumption of activity we returned to our camp.

"Well, Old Top. I certainly never expected to be picking nettles and brambles out of my toes got by bare-footing it away from an overgrown, one-eyed, moon-monstrosity," Barry commented as we awaited Jules' preparation of a much belated breakfast.

"Then you recognized the place where our new acquaintance conducted us by picture," I replied.

"Not much doubt about that now," he answered. "It's queer we didn't suspect it before. But then the Moon is supposed to be a defunct world, an astronomical corpse, incapable of sustaining life. We slipped up by taking for granted the generally accepted supposition. But I'm telling you a thing has to be more than dead to keep some other thing from making its living off it. That sure was some trip—to think of a revisualizing projector, I'll call it that, capable of producing visible mental impressions—an eye that works both ways. Here we poor mortals are priding ourselves by lately accomplishing mechanically, in a way, that which these monstrosities had the physical equipment to do for eons of time."

"Yes, we've got a long ways to go to catch up with nature," I replied. "Most of our discoveries and accomplishments have a natural counterpart in the abstract—are merely crude copies of some functions or phenomena long in existence. And the analogy might be the more startling if our knowledge was not confined to earthly limitations."

"But the main problem now is to determine just what this visitation means; what motive inspired the long and no doubt perilous trip. I don't remember anything in that farewell conference as explanatory; do you?"

"Not directly," he answered, "but from what I saw throughout that trip I can imagine one. They didn't dig out all those pits and craters for exercise alone; neither was it an engineering construction in the ordinary sense. It was just plain grubbing for sustenance to my notion."

"Taking the vital elements directly from the soil without interposition of organic growth," I suggested.

"Exactly," he agreed. "Which means that there is no replenishment. So in time they're bound to run short and seek other sources of supply. Our visitor, despite its marvelous equipment and seeming intelligence, is but a scavenger, an interplanetary vulture or hyena, feeding on the carrion of dead worlds, capable of digesting the last soluble remnants. And they have started out to give us the once over."

"But our world is a long ways from being dead," I countered. "Still one can readily conjecture what might happen if a group of them set to work to clean up things to suit their own requirements. I imagine it wouldn't take very long to devastate a large area, even an entire continent to a moon-like barrenness. They seem to exhibit a systematic and thorough craftsmanship in their particular line."

"I'll say they do," he replied. "Our little old world would have as much chance with them here as an apple in a flock of Japanese beetles. They chewed poor, weak Luna lopsided and stopped her natural axial rotation, destroyed the last vestige of oxygen producing vegetation and vitiated her atmosphere, making her a corpse on whose fixed, pock-ridden stare is recorded the agony of her death struggle."

"I don't think this visitor came here to engender friendship or for any other altruistic purpose," I replied. "Even if so, it's far too capable of producing mischief to be allowed to run around loose. No telling where its fancy may lead it from here. Not so pleasant to contemplate its sailing over a populous district or one of our cities, mowing a path of death and destruction. I tell you, Barry, it's up to us to see that it don't get away from here. not alone to prevent that, but also its return to headquarters and making a report—whatever that might be."

"You've picked a big job for us," he answered

reflectively, "considering that our total offensive array consists of three men—two barefoot—one camp-axe, one pop-gun, and some pocket knives. But count me in on any plausible plan; and I don't think Jules' love is so fervent that he'd have any scruples. But how about the other two moon-creatures? If we were not literally hoodwinked then three left their happy homes up there among the lunar craters and started on this inspection trip."

"They probably separated before landing," I surmised. "We'll likely hear something about them after we get back. I wouldn't care to tackle more than one at a time anyhow."

"Hardly," he agreed.

After our meal we called a council of war. There was now no mitigating of circumstances with the guide. He readily understood the gravity of the situation and necessity for action. The great problem was to determine a feasible plan of procedure. To attack it bodily with our puny weapons would only be suicidal and beyond consideration.

That it had, apparently, been willing to cultivate our acquaintance and reveal its identity was no indication that it would give us future consideration, or could be prevailed upon to meet our desires in any way. Therefore we were dependent upon strategy to accomplish anything.

We considered the chromatic oval and the periscopic eye as the most vulnerable spots and concentrated our attention upon them. If, as we supposed, its power was obtained from direct sunlight, filtered through the oval, and we could obstruct the light, it might not be able to rise from the surface. We inferred that it was near spent when it landed and was now recuperating; but due to the cloudy and rainy weather of the preceding days had little opportunity to do so. Or if we could in some way fasten shut the wig-wagging eyelid and blind it—but how?

"If we had a can of paint and a gunny-sack maybe we could do something." Barry facetiously suggested.

"This is a little more than a snipe-hunting expedition," I answered; "but your mention of a gunny-sack stirs my imagination; and I think we have one with us."

"Where," he asked. I pointed to our tent.

"I don't remember—Oh, I see," slowly nodding his head. "It might work—if we can figure out the application."

Our shelter, as I think I have mentioned, was only a tent-fly of rain-proof canvas about eight by twelve feet. This would nearly have covered the oval but there was no way of attaching it there with any assurance of holding as the anchor ropes were entirely too short. So having determined to center our attack on the other vulnerable spot and how we would do it, we immediately set to work.

We made a rough bag over a yard in diameter and somewhat deeper with a loose hem at the opening, sewing it up with unraveled anchor rope. Through the hem we wove a length of the spliced rope in which were inserted backward projecting thorns, making a pull string that once closed would not open again. By a loop the inverted bag could be hooked to the end of a long slender spruce sapling we had trimmed. A shorter and heavier one was prepared with a split in one end.

Bagging the Monster

AFTER Barry and I had wrapped our feet with remnants of the canvas, we moved our outfit over to the point. As there had been no apparent movement of the creature since we had left, we decided that then was as good a time as any. Quietly we descended into the glen. As before we were able to approach without being noticed, but now we kept our eyes on that knob. Carefully we hooped the bag, its mouth held open with a hoop of withes, to its pole and inserted the pull string in the cleft of the other.

"Hold it, Joe," said Barry. "I'm going to get our shoes before the excitement begins."

In a moment he returned with one shoe and a rueful expression.

"Look at this," and he began pulling it apart as though it were wet paper. "If we don't get away from here soon we won't have anything left but our whiskers—if that," he whispered.

Together we covered the last ten yards, Barry and I carrying the raised pole with its dangling bag, looking like a huge candle snuffer, while Jules kept pace with the other. Reaching the creature, we slowly lowered the trap until its mouth covered the knob, propped our pole against the side to hold it distended as the guide also stationed his. But it did not stir a bit. This was no surprise as we had come to believe that it was practically insensible to sound and, externally, even feeling. To what extent it was immune in the latter respect we were going to find out.

We gathered and piled a lot of loose brush about it, struck matches, and ran for the ridge. By the time we reached it, the fire had obtained a good start and the creature was almost invisible in a cloud of white smoke. A minute went by, then two, even three, and we began to have misgivings that even this drastic measure was to succeed in arousing it.

Then suddenly through a momentary rift, we saw the bag shoot upward dragging the split pole with it as the other fell to earth. For a moment it was motionless and then a violent twisting and swaying caused the pole to fly about like the handle of a reversed bull-whip until it was jerked loose and crashed a dozen yards away!

"By all that's holy, Joe, it worked," Barry shouted, gripping my arm. "Look! It's bagged!"

"Unless that eye can shoot it full of holes too," I replied.

Then it undoubtedly began to sense the fire, for suddenly as though a powerful blast from a giant bellows had struck them, the flames were flattened out, flying embers and swirling sparks flew in all directions. Now it began to move with a ponder-

ous tank-like motion all the while trying to dislodge the obstruction to its vision.

But the red terror was not to be so easily conquered or evaded. A dozen incipient blazes sprang up here and there, from the scattered torches and before long the floor of the glen was a billowing mass of flame.

For some moments we lost sight of it, only infering its location by a swirling spark-ridden whirlwind of flame and smoke. Then it came into view above the maelstrom of fire; it had risen and was slowly, erratically circling about. Across the glen it sailed and then blindly crashed into the wooded slope of the ridge. And then hell itself broke lose.

Lucky were we that it began to happen on the other side. We thought we had a fair idea of its power, or its latent destructiveness from what we had seen of it so far; but our imaginations never conceived anything so appalling.

Hardly had it struck when a Niagara-like roar drowned that of the fire and above the slope rose a clouded mass of foliage, of flying leaves, boughs, and branches stripped from crashing trunks by a tornado's blast. We could trace the scythe-like movement of those terrible front extensions as they mowed down everything before them—not alone mowed but blew to bits—and even dissolved the bits.

In a minute what had been a thickly green-grown slope of pine, spruce, birch, and ash was now a barren patch, an outstanding scar visible through a drifting cloud of brownish dust. Then out of the dust it emerged once more aloft, and still blinded. Slowly ascending, it swung about in our direction. We saw a veritable wall of fire, a tidal-wave of flame, rods high rushing toward us and we ran for our lives.

Under a slightly overhanging bank at the back of the ridge we crouched and listened, tracing the course of the monster by the roar of destruction. Several times we thought we must be in its path, and flattened our forms against our one sided trench. Once the blast actually swept the top of our bank and an avalanche of debris swept over our heads.

But soon the rending and crashing grew fainter and fainter; and we scrambled back to the top, over and through the wreckage, our eyes aloft to follow its direction. Out over the swamp we saw it, yawing and pitching like a boat in a storm-tossed sea, while a boiling, seething wake followed its course. On it went until it seemed no larger than a bird and then slowly sank and merged with the dun colored surface. A geyser of mud and water shot into the air, followed by intervals by others but of decreasing violence; and finally they ceased altogether. Over the swamp there remained nothing but its age-old desolation.

And there lies the end of that perforated trail.

CHAPTER IX

Serious Consideration

"WELL, Mr. Stewart, that was the experience I wished to recount to you," Crawford continued after a pause. "It's getting quite late, so I won't detain you, now at least, with the details of our return trip. How the remainder of that day and nearly all night we fought the spreading of the fire, which a heavy shower finally extinguished—of the cyclone-torn, fire-swept appearance of that little valley and surrounding ridge—of the agony of the return; bruised, burned, hungry, shoeless, we at last reached our camp and took a week to recuperate before starting for home.

"We had agreed to say nothing about our experience until possible to substantiate it with further evidence. Since then Barry and I have been continually on the outlook for some report or news item that would indicate a similarity of circumstances, a possible clew as to the probability of the other two moon-monstrosities having reached the earth. Today was the first intimation that such really had occurred and you may imagine my interest when you started to describe the peculiar road in New Guinea."

Mr. Stewart, who had been listening intensively and uninterruptedly got up and began pacing the room.

"A most astounding experience. A well-nigh incredible tale," he muttered; "and yet—" he stopped and pointed his finger—"say, Crawford; if I knew of any other reasonable explanation for that New Guinea condition, I certainly would classify you as a very gifted, convincing—ah—story teller. But I don't see any other way out than to seriously consider the experiences you have related. I see," he continued, resuming his seat, "a possible clarification of certain aspects that I have not mentioned in my lectures.

"One of them was that in questioning the natives as to probable cause of that trail through the jungle, they excitedly pointed aloft with many gesticulations from which we inferred they had seen our plane and, quite naturally, considered it the cause. And they would go miles out of their way to avoid crossing that dead strip. It might be that it was something else they saw.

"But did you not mention taking some photographs? I presume though in all likelihood they were—ah—shot full of holes, or burnt up, or lost as usually happens in all good stories."

"Not at all," Crawford replied. "They luckily escaped all that and I hung on to them like grim death. But they might as well have been subjected to any or all of those contingencies for all the good they proved to be—as evidence. The exposures were good and the films in perfect condition, for they showed the details of the glen with the wooded ridge in the background; but where the creature should have been there was only a dark blur of irregular outline that might be construed into most anything. It seemed as though the actinic rays

were entirely absorbed in that particular region and none were reflected to the camera. To me they are convincing evidence of very peculiar phenomena; but to a mere observer they would only be a number of wasted films."

"Quite extraordinary," Stewart replied. "That's something else to consider."

"Now, I want to tell you this: I will be back here in a few weeks and will notify you in advance. Have your friend Barry with you and we will go into this more thoroughly. In the meantime I will endeavor to get reports from all recent explorations and expeditions and any other source from which information might be obtained bearing on the case.

"This may mean serious business before it's settled; and," he continued with a sparkle in his keen grey eyes as he arose to shake hands, "it may prove to be a mighty exciting hunt after a most peculiar game."

THE END

Science Fiction Readers

IF you are a science fiction reader, we have a big treat in store for you. Be sure to get the August issue of AIR WONDER STORIES, the sister magazine to SCIENCE WONDER STORIES.

This new magazine is the one and only science-aviation fiction magazine in print—*there is nothing like it.*

AIR WONDER STORIES contains stories of aeronautics of the future.

Practically all the authors, and some new ones we have discovered, who contribute to SCIENCE WONDER STORIES are also contributors to AIR WONDER STORIES.

Whether you are air-minded or not, makes no difference. You simply must read AIR WONDER STORIES. Some of the best science fiction stories will be found in this new magazine and you are missing a great deal of entertainment and stimulating thoughts if you do not get the August issue.

"The Silent Destroyer"

By Henrik Dahl Juve

is one of the greatest science fiction stories ever written. It contains more science to the square inch than any science fiction story you have ever read. It is one of these stories that will make history with every dyed-in-the-wool science fiction fan.

Air Wonder Stories On All Newsstands July 10th

The most unique magazine in print. One issue will convert you. Be sure to reserve your copy with your newsdealer now as we print only a limited supply.

TABLE OF CONTENTS

THE SILENT DESTROYER
By Henrik Dahl Juve

BEYOND GRAVITY
By Ed Earl Repp

THE ARK OF THE COVENANT
By Victor MacClure
(A Story in Four Parts.) (Part 2).

THE PLANET'S AIR MASTER
By Edward E. Chappelow

WHAT IS YOUR AVIATION KNOWLEDGE?
Aviation Questionnaire

AVIATION NEWS OF THE MONTH

THE READER AIRS HIS VIEWS
Letters from Readers

DON'T FAIL TO SEE THE ANNOUNCEMENT ON PAGE 195 OF THIS ISSUE.

The Radium Pool

by Ed. Earl Repp

Gradually the high-pitched scream became a steady hum. Under the whirling pressure of the column, the sphere was changing slowly into a cylindrical shape. I stared with unbelief. Surely my brain was playing pranks.

To begin with, you may not believe this story, yet I sincerely urge you not to allow the apparent strangeness of it to create a prejudice against it. Many weird tales, most of which are true, come from the vast wastes of desert jungles. How little we actually know of Death Valley—the lowest spot on earth and the hottest! With its shifting sand-dunes, sun-baked hills, saline formations and mysterious atmospheres, the Valley of Death has long been the subject of mysteries for fiction and fact. In truth, it is the one spot on the North American Continent that has not been thoroughly explored either by desert rat or scientist. This is true especially of what lies beneath the surface. Neither has it been thoroughly explored on the surface —the area is too great—and it has never been found possible to remain there for any length of time! Only those who have spent much time in Death Valley can appreciate its intriguing mysteries, its radiant beauty and deathly lure! *James Dowell.*

ED EARL REPP

CHAPTER I

A Choice Assignment

AT my little desk tucked away in the corner of the editorial rooms of the *Outstander*, behind the broad, paper-littered table of the city editor, I sat praying for something to happen. Anything would do that would break the spell of semi-consciousness that had captured me during a lull in city news. I had cleared off my desk, inserted a new ribbon in the typewriter, winked a couple of times at the switchboard operator, and fell into a delightful doze. As star reporter for the *Outstander* I felt that I had *some* privileges and, under the conditions, a little snooze would not imperil my position, providing I did my snoozing where the city editor would have to yelp only once to have me at his side.

Earlier in the day I had interviewed the District Attorney without any startling results. I had gone so far as to visit the Grand Jury impanelled to investigate charges of bribery in the city administration, but failed to learn the results of their probe. Then I had returned to the office to await anything that might come in. Now, under the pall of a quiet and none too cool afternoon, even the city editor was fighting to keep awake.

As I dozed, I dreamed of visiting the glacier at Bishop. Then I floated down to Rio Janeiro. From there, all in a period of perhaps several quiet minutes, I traveled to San Juan Capistrano where I found that the old Bells of San Juan Mission were ringing loudly for the first time in a half century. I awoke with a start. The telephone on the city desk was jangling like a fire-bell.

I sat dazed for an instant. Then my brain cleared from its inertia and I sat back expecting something to happen. I heard the City Editor slam down the receiver. His swivel chair squeaked as he spun around.

"Dowell!" he called, lustily.

"Yes sir!" I answered, rubbing my bleary eyes.

"Oh, I see you snapped out of it, eh? I was figuring to have the janitor bring you a cot to sleep on—or send you to a hotel for a rest, or———"

"Or tell me to take a vacation, huh?" I returned. "This is a helluva day!"

The City Editor grinned.

"Where'd yuh like to go, Dowell?" he asked.

"North Pole, boss! Or maybe up to Bishop to sleep in one of those glacial caves they rave so much about. Ought to be cool there."

"That's a good one on you, Dowell. But I am going to give you a little vacation in appreciation of your commendable work of late. I'm mighty sorry I can't let you go to the North Pole or to Bishop either. You're going to Death Valley!"

"I'm what!"

"I said you leave for Death Valley and I don't mean in December either!"

"That's a fine——oh well, it might be worse!"

"It could be, but it isn't. I gotta send you out because you seem to be the only reporter on the staff who understands scientific work. You like geology, archaeology, anthropology and so on. You ought to be happy at a chance to work with a real scientist. You dash out to the Southland Institute of Technology and make arrangements with Professor

HERE is a new author who will command your attention through the pages of this magazine, we hope for a long time to come.

In his first effort, Mr. Repp has given us a wealth of everything that should be contained in a first-class science fiction story.

Radium, which forms the main vehicle for the author's story, is a substance of which very little is known as yet. It is so scarce and so expensive that only the wealthiest institutions can command even a few grams.

But radium may not always be scarce, indeed, there may be hidden, somewhere, unlimited deposits in the form of a salt held in solution.

What physical and physiological effects a large radium pool might have on one, is not known. But one thing remains sure, that if you did approach closely to a large amount of this substance, something very strange would happen to you. Indeed, if you remained there long enough it might be that your entire physical structure might be affected.

This is the author's conclusion and it is based on sound scientific reasoning.

Bloch to accompany him to Death Valley. Professor Bloch phoned in—yes, while you were sleepin' like the original babe in the woods—and invited us to send a reporter out to cover his reconnaissance of some important human fosils reported found in the Valley. He'll be gone several days, will pay all expenses and you ought to learn something. It'll be a feather in your hat if you bring in a corking scientific yarn for the *Outstander* Syndicate—and don't forget the bonus offered for the best story of the month."

"But its quite out of the ordinary to send the star reporter out on a goose chase, boss," I parried, hoping that he'd change his mind.

"It is, but not when a man like Professor Bloch asks for the star hand on this journal. You know he has always suspected that there's more in Death Valley than anybody ever learned. Who knows—he might make the greatest discovery ever as regards human development in America! I'm doing you a favor, Dowell, but you don't seem to appreciate it! I'd go myself if I wasn't tied down to this desk. Now get the hell out of here and remember that if a man bites a dog—that's news. And don't try to make a monkey out of this paper, either!"

"Okay, general! I'll wire you from Barstow on the way back so you can reserve a room for me down in the ice house. And thanks for the—er—the vacation!"

"Don't mention it, Dowell!" the City Editor laughed. "Have a hot time!"

A Rescue

THE trip to Death Valley was uneventful. We camped at what Professor Bloch believed to be the lost Mesquite Springs. The sun had just settled over the edge of the Funerals and the pack animals which we had picked up at Stovepipe Wells were munching barley at the tail of the buckboard when the professor beheld something bobbing about among the sand dunes. The object was too far away to make certain with the naked eye whether it was a man or an animal. Professor Bloch got out his field glasses and discovered that it was a man.

We watched him for several minutes and during that time he fell seven times. He was staggering in circles and appeared to move only because some hidden power forced him to. Presently he fell again and this time he lay still. So Professor Bloch saddled a burro and rode out to get him. I stood up on the tail of the buckboard and watched the silent drama.

Coyotes had followed the stumbling man patiently waiting for him to die. The professor rode to a spot where they were squatted on their hunkers, circled a small area and found his man. He brought him back to the camp, and after we washed the alkali and sand ticks from his eyes we gave him water. When it was safe enough for him to have all the water he wanted, we gave him food, after which he said his name was of no consequence but he had been foreman of the Panamint Mining Company over Balch way. Hysterically he told us that he had lost his partner, interspersing his words with fragments of a tale that made Professor Bloch's strong brows knit together and his eyes flash.

"He's gone—he'll never see this world again!" the man interrupted when I asked him if it were not too late for us to help his partner.

He inquired if by any chance we had ever heard of his partner, "Driftin' " Sands. I told him that I had, for I wanted the story which seemed to lie hazily in the back of his befuddled brain.

"Well!" he said, hysterically, "He's found his sweetheart, Allie Lane! We followed the trail together and we found her 'way over in hell across the Manalava plain! You can see it way over there in hell—it's the red streak table land off to the southeast. For more than forty years, Sands had been driftin' over the deserts searching for her. At last they are together!"

"Sands and I struck out for the Manalava Plain. Our water gave out. We were looking for a lost mine and Sands' girl!"

The prospector took a long pull at the canteen. Professor Bloch and I squatted in the sand beside our tiny cook fire. The mine foreman pointed with trembling hand, towards the southeast where the vague and sinister outlines of a mountain range loomed mysteriously in the ghostly desert dusk.

"That's a terrible place!" he groaned. "We found a band of heathens there where not even a sidewinder would dare to venture. That flat, above all else in these deserts, is the hottest place this side of hell! And the heathens? Waugh!—"

Professor Bloch sat bolt upright and eyed the prospector whose withered, leather-like visage loomed like a spectre in the glare of the camp-fire. His face glowed with a ghostly tint of greenish phosphorescence—like the radium dobbed face of a glowing watch-dial!

"Pardon my interruption, old man." Professor Bloch said, apologetically. "Did I understand you to say that strange human beings exist on the Manalava Plain?"

"A band of heathens, yes!" replied the prospector with a shudder. They ain't human, they're frog-faced beasts about seven feet tall, with funny long arms, long legs and big heads! We stumbled on them accidentally and they made us prisoners! God help Driftin' Sands and Allie Lane!"

"Did you escape?" I inquired, rather disdainfully, for I was figuring that the prospector suffered from the heat. I glanced over him. His hands now were steady but his lips trembled a trifle. He shook his head slowly and closed his eyes. I accepted the movement as an attempt to shut out some terrible vision from his sun-scorched brain.

"Yes, young fellow, I got away! But only because I was left for dead! And I come mighty close to passing on, too. I got a family over at

Balch, and kids that's been needin' me, otherwise I couldn't have made it here!" he answered, heatedly, taking offense at my doubting attitude.

"I always suspected that a race of peculiar people existed out this way," Professor Bloch put in. "This account does not startle me in the least. In fact, my associate, Dr. Jorg Jamesson, recovered some strange and almost human remains in this neighborhood that gave rise to startling revelations. Lately our astronomers have noticed peculiar atmospheric conditions over Death Valley that seemed to indicate some tremendous radioactive force emanating from the earth's surface!"

"If I remember right," the prospector commented, "Sands and I met your Dr. Jamesson sometime ago around here. We didn't have time to talk much with him. I believe he showed us some bones that appeared to be human. Let's see! Yes! He showed us a skull—a big skull that was twice as large as mine, with an overdropping forehead, and the face of a frog! Those Manalava heathens had the same kind of froggish faces!"

"Then that evidently proves Dr. Jamesson's contention that a race of freaks exists or existed here in Death Valley!" Professor Bloch slapped a thigh enthusiastically. Then turning to me he said: "Dowell, I told your City Editor that something was going to be found out here to substantiate Jamesson's assertions."

The Prospector's Story

I NODDED. "But what's the story about Driftin' Sands and Allie Lane?" I inquired of the prospector. It sounded like a good human interest yarn to me. I did not believe that it had any significance with Professor Bloch's project but it would make great feature stuff!

"Yes, yes! Go ahead with your story, old timer, by all means," the professor said.

"Well," the prospector began, somewhat wildly, "As I said, that's a terrible place, that Manalava flat, and we were near the end of our strings when we reached it.

"Our water was gone. We had two good drinks from a barrel cactus before we reached the edge of the Manalava flats. That rotten stuff didn't help any to quench our thirst. Near the flats we found a good spring with dead men's bones strewn around it. A fight had taken place there once—Indians and whites, and they must have fought for the water.

"The spring lies in a little box canyon opening out into the valley. Sands and I could see the sun glistening on the whitened bones even while we were yet a mile away from them. Our water was gone and it was safer to continue than to turn back.

"The whites had held the spring and the Indians fought from behind boulders on the hillsides. By the spring there's a semi-circle of old prairie schooners with arrowheads sticking in the rotted framework. You can find more arrowheads around the skeletons. There are no drafts there and the bones have lain untouched for years. Even coyotes and buzzards have stayed away from the Manalava Plain! I don't understand why Indians, with their superstition, would venture near the earthly hell.

"The spring was worth fighting for, I said to myself, as I ducked my head in the water. The water was cool and tasted good, but it had a greenish tint—that was the color peculiar to the heathens under the Manalava Plain! We camped at the spring all night.

"Sands did not sleep well that night. He seemed to be high-strung and excited in the morning. He claimed that he heard voices throughout the night and after breakfast he began talking about Allie Lane.

"You've heard the tale about Allie Lane, of course. Everybody who has lived in California long must have heard about it. She was Sand's sweetheart back in Kansas City when he was a youngster. He came to California first and Allie, with her father, started West with a wagon train the following spring in 1880. If that train had ever arrived, Sands would have known it. For over forty years he had been searching for news of Allie up and down the coast until it cracked his mind some.

"Allie must have meant a lot to him, for he never married and for forty years he's been drifting over California asking folks if they'd ever met up with anybody by the name of Lane from Kansas City.

"Allie Lane had been a member of a train such as lay scattered around the spring. This was worrying him, I could see. He was a bit off on the subject after having searched for her so long. It taxed his brain, and Sands was an old man. I watched him as he puttered and poked around those whitened, petrified bones.

"There was a wagon train—the remains of one that had probably taken the southern route across from El Paso, heading into California over the old Fremont Trail. It wasn't necessary for them to head into Death Valley; so they must have gone off the right trail and strayed through an unknown pass into the Valley where they died fighting the Apaches at this water hole.

"I tried to argue the old fellow out of the idea that Allie Lane had been killed, telling him that she had arrived safe, married, and forgotten all about him. But he would have none of it and flew into a rage, saying that she promised to wait for him and that he'd meet her alive in California. I let it go at that.

"I sat down on the wreck of one of the schooners and watched him putter around the bones. He had loved this Allie Lane in the days of his youth when he left her back in Kansas City. I suppose he had an indelible picture of her as she was when he left her, stamped in his brain, and did not figure that

now she would be an old lady, even if she was alive.

"So Driftin' Sands continued his two great searches. One was for Allie Lane, first and always, and the other was for gold of which he had found plenty.

"I'm sure that Sands and I were the first to enter that Canyon since the fight by the spring. There was not a speck of ashes to prove that anyone else had ever camped there.

"The canyon was free from sand storms, and sheltered on practically all sides except for the Valley opening; and even if the sight of human bones would drive one away, there was always the spring to lure a man back. But it was hard on the nerves to stay there. There was something eerie and ghostly about the whole section of desert that was not caused by a few bones scattered around. We were to learn what it was later.

"Sands found an old trunk half buried in the sand. It was rotted and sprung by sun and weather and it crumbled at the touch of a hand. In that trunk Sands found an old family picture album. The photographs were so dim that very few were distinguishable. He pored over them nervously and when he had gone almost to the last page, his shaking fingers held a leaf. He found a picture that glued his eyes to the rotted book and then I had my first sight of Allie Lane!

CHAPTER II

What Sands Heard

"THE face on the tintype displayed the features of the most beautiful girl I have ever seen! Her features were clear-cut, her eyes soft and appealing. In spite of the years, that one picture, out of a hundred old tintypes, remained clear and distinct. Underneath the picture was a written description that we could not read with the naked eye. The ink had long since disappeared, leaving only faint traces of point imprints. I got out my magnifying glass that I used to study ore specimens, and read the words:

"Allie Lane,
"Kansas City, Missouri.
March 19, 1878

"I handed the glass to Sands and went over to douse my head in the spring. You see, I'd heard the name of Allie Lane so many times that when I came face to face with that picture of her, it fairly upset me.

"Presently Sands returned my glass and without speaking we packed our outfit, rolled in the spring, and struck off toward the Manalava Plain.

"That night was like all the rest. We wrapped ourselves in blankets and slept. But toward morning Sands awakened me.

" 'Pardner! Get up!' he said. 'I hear a wagon passing off there in the valley and if we hit the trail now we can hook up with it until we reach the Manalava Springs. It's a long hike to the flats and water's scarce! Hear the wagon crashin' through the brush?'

"I raised on my elbow and listened. There was not a sound to be heard. I looked at Sands queerly. Was the heat and the excitement of seeing Allie's picture, affecting his mind, and anyway, why should a wagon of all things be trekking thru the desert during the dead of night? Anyone but an utter fool would use an auto. But I yielded to his excitement and we started out at once, leaving behind an extra blanket and some canned goods so as to travel lighter. I allowed Sands to lead where he thought the sounds came from.

"We went on and on, I all the while arguing that I could hear nothing while Sands insisted he heard the wagon continually.

"Little by little the gray and orange of approaching dawn began to steal over the valley. The world was assuming a definite shape and the day's heat began to mount even before the first rays of the rising sun were visible. A mile in front of us a great, red streak rose against the skyline, looming dimly and awesomely out of the lightening eastern heavens. Sands remarked at its ghostliness and informed me that we were nearing the southern extremities of the terrible Manalava Plain. I had never been in the section of Death Valley and of a certainty, Sands had never been nearer than he was then.

"In some forgotten day a volcano had scattered its red hot lava and settled it into a stretch of plain which covered an area of thirty miles either way, although no trace of a volcanic mountain was visible. Bare and flat as a table-top and as hot under the glare of the sun as the inside of an oven! Such was the Manalava Plain, never explored, unmapped——a lost world of its own.

"Sands kept on insisting we were coming nearer to the sounds.

"Rapidly it became light enough for us to see the Plain. The sun, a huge fiery ball, popped up almost suddenly from behind the Manalava Plain and instantly the world was sweltering. Its golden glow reflected on the red lava of the Plain and created a murky green haze that added to the heat and burned acridly through the lungs. The odor was ungodly and unworldly!

" 'There's the wagon!' Sands suddenly exclaimed.

"I looked all over the desert, and not a thing like a wagon did I see.

" 'I don't see a thing,' I told him soberly.

" 'You don't,' he exclaimed incredulously. 'Why look out there.' He pointed toward the base of a low hill. There was not a thing to be seen. I knew then that his mind was slipping under the terrific strain. I tried to argue with him. I even shot off my pistol to show him that there would be no reponse. But Sands insisted on going on. Rather than have him travel into that hell alone, I shook my head and followed after him.

"We climbed the buttress of a low hill and swung

to the left, discovering a natural causeway that led up and out into the very table-top of the Manalava Plain itself.

"Before us in unbroken desolation lay the forgotten country—Manalava Plain! The formation of the floor was a soft lava-like surface—rock that had once flowed in liquid form and after hardening to some extent, gave the country a flat and shiny appearance like a great field of red asphalt.

"'The wagon is gone,' Sands exclaimed suddenly.

"'That's mighty peculiar, Driftin',' I said 'That they're gone when you said that they weren't more than a mile ahead of us.'

"'I don't savvy it at all,' he replied. 'But let's follow further. They'll sure need help.'

"Helplessly I followed.

Following A Phantom

"HERE was the Manalava Plain—as flat and smooth as a plate of glass—and stretching for miles either way, bare and deserted. Surely we were the only actual beings on the mesa!

"Perhaps, I thought, old Driftin' Sands was suffering from hallucinations. Perhaps the sight of the bleached bones back at the spring had gotten into his blood. I wanted to give up the chase but Sands declared again he would continue alone. I had no alternative but to accompany him. To me death beckoned either way and I'd been with Sands so long now that a few more miles would not matter.

"Presently we came upon a weird sort of a cactus tree—a species of a kind that I'd never seen on the desert! It was red instead of green and had long, flowing branches like the tentacles of an octopus! The tentacles twitched restlessly although there was not a breath of wind to stir them. I warned Sands to stay a safe distance away from it. The thing seemed alive! Farther off, standing dimly in the green murky haze, I saw other trees like the one in front of us. They stood motionless and stiff.

"By all the laws of nature, the trees in front of us should not have been growing there—should not have been on this world at all! We stopped and looked at each other.

"We looked at the cactus closely. Its tentacles were waving spasmodically as though warning us to return from whence we came. I tore my eyes from it and studied the earth. Sands gasped when I pointed out to him the fragments of a human skull and other anatomical portions of the human frame, apparently crushed, strewn under the waving, rubber-like tentacles of this weird cactus.

"I felt an urge to dash away from the spot and it was with a mighty effort that I controlled an insanity that was creeping through my brain.

"'Do you admit there's no wagon here,'I yelled at Sands.

"'I guess there isn't pardner," he acknowledged, downcast. His shoulders seemed to droop more than ever and the alertness in his eyes suddenly disappeared. 'But how do you account for my hearin' a man, a woman and a wagon? They've got to be here; so lets follow them out.'

"My insane desire to run now manifested itself into a reality, and with Sands at my heels, I started off at a run. Eventually I steadied my racked brain and slowed the pace. Sands came up, breathing heavily at the exertion. I noticed that he had cast his pack away and clung only to a gallon canteen in which I could hear the water sloshing around. The sound told me that it was almost empty.

"Presently we discovered the remains of an old schooner. It was just like those back at the spring. Its canvas tarpaulin, bleached white, clung from the top-ribs in streamers of gossamer. Not a single bone could be found in front of the wagon, lending more mystery to the trail. Where had the horses gone? What had become of them? Surely, there would be bleached skeletons in the traces had the horses been deserted.

"'The horses laid down here.' Sands was saying as to himself, kicking a foot at two wallows in front of the wagon. 'But they must've got up and wandered away after restin'. See, the traces have been cut! The man picked up the woman and packed her off. His trail is deeper now. We ought to find 'em soon.'

"I said nothing. Perhaps he had seen something and I was the one who was mad. Some story was plainly written on this wagon. Sands pointed at the side board. Cut deep were the even letters of Alfred Forsythe Lane, Allie's father. Below the name was a scratched message. With difficulty we read it.

"'God have mercy on us. Our water is gone—this is the end. I love you, Robert Sands of Kansas City. If you ever see this, you will know!'

"Sands sat down on the rotting tongue of the wagon and cried. His great, booming voice quivered with emotion as his body twitched with sobs. Tears rolled down his withered, weatherbeaten face in spite of the terrific heat of the Plain that sucked the moisture from our bodies. Hands, gnarled with years of toil and sorrow, fondly held the old tintype taken from the faded album found at the spring.

The Radium Pool

"SANDS straightened. His eyes, now dry and dim, surveyed me for a moment.

"'You'd better take this water, pardner,' he said, 'and hit the back trail! I'm going to follow this to the end and there'll be no return. You take it and go back to your wife and kids! They'll be needin' you, pard, like Allie needed me. Take it!'

"Instinctively I reached out for his proffered canteen. Then I thought better of it. I certainly did want to go back. What would my wife and kids do if I failed to return! But if I deserted Sands I would never be able to live it down. I decided to stick it out. A few more miles could not matter now and the chances of me finding my way out

were mighty slender, anyway.

"'I couldn't take it, Sands,' I said. 'I'd rather go ahead and see what's beyond. I—I—er—er rather like this hike, you know.'

"And so I followed him again.

"'There they go, pardner!' he shouted finally. 'Down the draw! Hurry and we'll catch up with them!'

"I looked up in time to see two forms crawling on hands and knees down the draw. But I am certain that my own mind was giving way to hallucinations, and so to satisfy Sands I started forward at a trot. Sands was at my side. As he ran, his jaws were beating a loud tattoo. My heart ached for him and his sweetheart whom he'd searched for so long—Allie Lane! Maybe he would find her, I thought. But how!

"Presently we arrived at what we thought was the draw down which the two crawling figures had vanished. Instead of finding what we expected we actually encountered a saucer-like crater which I assumed at once to have been the one from which the lava forming the Manalava Plain had erupted. We stood on the brink of the yawning pit and noted that in the center, surrounded by overhanging lava forming a circular cave, brilliant with a green phosphorescent glow, was a pool probably a hundred feet in width. The pool seemed as alive as that grotesque cactus with its restless tentacles.

"The pale green that filled it, with its ghostly hue, reminded us of the spring at which we found the Lane album. The material shimmered and scintillated and even from our height we felt a terrific heat that must have come from the stuff. There was a powerful odor coming from it, too, sweet and nauseating. The glare from the pool seemed to burn our skin even at the distance we stood from it. Nowhere was there a sign of the mysterious crawling figures—the man and the woman, although under our feet were the marks of a ragged trail.

"'My Lord, Sands!' I shouted, 'the heat of that pool tells me that it must be radium.'

"Sands looked at me with a puzzled frown.

"'Hell!' he expostulated, 'there's not that much radium in the whole world and we wouldn't know it if we seen a lake of it. Looks like some green salt solution to me and indications point to some funny deposits here! What's that unearthly noise?'

"I cupped my hands behind my ears to catch the sound that Sands had heard. My hair literally stood on ends. Spooky? Lord! I couldn't have moved a foot if I wanted to. I was glued to the spot. The weird sound, like the low moan of a woman in mortal agony, issued from the circular cave surrounding the luminous pool. It grew louder until the Manalava Plain groaned under the tumult. The sounds penetrated to the core of the brain and seemed to beckon us down into the crater. Sands was swaying to and fro as he stood on the slight parapet overlooking the crater, in perfect rhythm to the tempo of the devilish sounds. I felt that I too was keeping the same accompaniment and it was with an effort that I broke the spell.

"My hand dropped to my gun butt. I tore it out of its holster and fired rapidly, thumbing the hammer, into the pool. Sands yelled. Like a living fountain, long columns of luminous green and red and violet flame shot up to the parapet. Simultaneously we both leaped back. The air seemed alive with some mysterious vibrations. Finally it died away and the tumult issuing from the circular cave settled down to a low, steady hum. We once again stood on the crater's escarpment and looked within. The pool was glittering restlessly.

"'We might as well have a close look at that pool, pardner," Sands reminded me as I stood rooted on the edge of the crater, studying the formation surrounding the pool. 'I can't make it out. If it's some radium compound, you'll be a rich man. Your wife an' kids back in Balch will be needin' it, I'm a thinkin'. Let's go down.'

"Sands stepped over the escarpment. I followed him down into the crater. We paused about twenty feet from the edge of the pool. The heat was terrific—so great that it caused the blood to race to my head, and my heart to beat rapidly. And more intense came that mysterious vibration in the air, and a something that seemed to be eating into my flesh. I remarked about the phenomenon to Sands and told him that it must have been caused by some unknown power of radium. Rather than risk touching the stuff I threw a piece of cloth on it. There was a little sizzle and the cloth seemed literally to vanish before our eyes! He then took his revolver and dipped it in. The hard steel of the barrel melted like lead in a blast furnace, yet the butt in his hand did not heat beyond sun-temperature. The melted steel floated to the surface like slag and drifted out into the center of the pool, to sink again in a tiny whirl. Sands fondled his useless gun speculatively.

"'Pardner,' he said, 'You're lookin' into a pool of some radium compound! It must be radium for I've seen about everything else in its line. If Allie and her father came too close to this, you can imagine what happened to them. I fear the worst.'

"'Well,' I said, 'I don't like to think that your friends ended near the pool. We might see some bones if they did. Let's take a look under these overhanging shelves. The caves might tell us something.'

"'I don't reckon we'll find anything, pardner,' Sands returned, sick at heart and utterly dejected.

"'Can't tell! We've seen so many strange things that I'm interested,' I said.

"By all the laws of human nature and its greed for the precious, Sands and I should have danced around the radium pool with glee over our discovery. Untold wealth lay exposed before us, but under the sadness of our circumstances, the living, pulsating pool was nothing. The radium, which we believed oozed out of the old volcanic crater, could

ruin the world, with its great power and radio-active qualities.

CHAPTER III

Eldorado

"AT any rate, we picked our way carefully, shielding our faces, remaining as close to the cave wall as possible, peeping intently into the greenly illuminated circular cavern. Glowing stalactites hung from the cave ceilings in mystic forms. Precious stones and metals in countless numbers cropped out of the lava-like formations. Rock which Sands had accepted previously as cinnabar was red rock-lava bearing iron pyrites and black quartz, containing a wealth of sapphire and diamond-like stones that glittered invitingly under the glare of the green rays cast off by the pool.

" 'My God, Sands!' I shouted eagerly, forgetting momentarily my sorrows and sympathies for Sands and his sweetheart of long ago. 'We've struck it! This is the real El Dorado! It is like the myths handed down by the Spaniards! Wealth! Riches! Power and——'

" '——and unhappiness, greed and all the rest!' Sands added, staring at me curiously. 'It means the fulfillment of your dreams, pardner. You know what it means to me! To me it means the loss of all that I've ever held dear in this life. It means that I've spent my life in quest of happiness—and lost it right here at this pool! Do you realize that, pardner?'

"I most certainly did realize it and I calmed down to once again share Sands' great sorrow. He had trailed Allie Lane and her father over the forty-year old trail. Here we believed that it ended forever. No need to search farther. Yet for some unaccountable reason, Sands insisted that she was still alive or if not alive, some remains must exist in that vicinity.

"As we continued our search and explorations near the mouth of the cave, the weird, ominous moaning that vaguely portended the advent of something untoward, became audible again. Sands and I stopped in our tracks to listen. Coming from the far side of the pool, the moaning increased gradually until it became a steady wail like the shriek of high-speed machinery. We stood watching the spot which unlike the part of the crater on our side, did not glow with the green luminosity. It seemed to be an inky black pit. Not even a stalactite was visible!

"Suddenly as we stared at the spot, the blackness became shot with myriads of colors until it glittered blindingly. The wail was now a terrific shriek. The Manalava Plain seemed to groan under some tremendous impulse emanating from below our feet. The earth swayed and rumbled. From the pool, came a mysterious sputtering and a tiny swirl in its center at first, suddenly became a whirling maelstrom. A thin, silver-like column rose several feet into the air from its middle. Like a miniature water-spout, typical of typhoon infested sections of the South Seas, the rising column whirled faster and faster.

"Meanwhile, the once black, bottomless abyss which had suddenly become charged with blinding colors, was changing now to a more solid hue. Green was transplanting the reds and vermillions, and thin, wisp-like rays of yellow that seemed to charge the atmosphere with a super high-tension activity, were twitching nervously in the pit. Gradually the colors merged into a solid mass of luminous green and out of it spun a glistening sphere that appeared to be a ball of the same liquid that was now whirling over the pool!

"The sphere, probably twenty feet in diameter, moved slowly at first, toward the pool, its surface glowing as it revolved with a terrific speed. The atmosphere became stagnant and penetrated deep into the lungs, but Sands and I were too stupefied to move a muscle. I felt a sudden panic seize me and then breaking the grip of stupefaction I ran like a mad man along the edge of the whirling maelstrom. I was struck with fright. You cannot conceive my terror as I stumbled along the pool! I forgot about Sands—forgot about everything in my blind unreasoning. I felt no fatigue as I ran, only stark, mad terror.

"In my wild terrified scramble for safety, I ran past the only exit or entrance down into the crater and soon found myself face to face with the spinning sphere! Bright, swift moving lights passed around the sphere as it emerged from the abyss. The yellow rays were gone now and as I stared at it in my utter terror, the sphere began to glow like a great emerald ball. The high-pitched scream was more terrific here and it pounded in my eardrums with a metal-edged sharpness that sent me blind and unreasoning back around the other side of the pool! In my terror I thumped into Sands, who was standing in the same spot where he had been when I started my mad dash. The collision brought us both to the crater floor, clutching for the slightest handhold to prevent us from rolling into the ghastly pool. At the very edge of the pool we came to a stop. Sands put out a hand to brace himself but the tips of his fingers accidentally dipped into the liquid. He jerked back his hand with a bellow. The first digits of his left hand had disappeared, leaving instead, completely healed stumps! The shock of the collision restored my sanity and I helped Sands to his feet.

"We cast quick glances at the sphere. It had moved from the opening of the pit, now lighted brilliantly red, and was whirling at the top of the column in the center of the pool! Gradually the high-pitched scream became a steady hum. The sphere was spinning faster and faster under the whirling pressure of the column. The ball was changing slowly into cylindrical shape, with a sharp-pointed nose and concave butt which gradually thinned out. I stared with unbelief. Surely my brain was playing pranks. I shot a glance at Sands. The old fellow seemed like a statue, im-

mobile as a rock. Insanity was gripping him, I could see, and I screamed.

"Suddenly, the hum of the sphere's rapid whirling motion ceased. Like a bullet shaped projectile it shot into the air, charging it with sparks of pale green lights that drifted back into the pool and settled. We caught a glimpse of the projectile as it leaped from the column. That was all. Immediately it was gone leaving behind only the floating green lights that, even in the radiance of midday, shone brilliantly. The fearful scream of its passing through the atmosphere gradually died away as its distance increased. At my scream Sands had regained control of himself. He placed a palsied hand on my shoulder and stared at me incredulously.

The Skeleton

"'DID you see it, pardner?" he asked, completely unnerved.

" 'Yes!' I answered, 'I've seen it whatever the thing was!'

"Sands stared at me, mouth agape.

" 'Pardner,' he said, 'you look like a ghost! You're face and hands are turning green! Your skin is getting the same color as the stuff in the pool!'

" 'You don't look like a white man yourself, Sands,' I managed to jest at him, trying to control my agitation.

" 'Mebbe,' he returned, somewhat calmed, 'but, by jingle, I'm beginning to feel younger! Maybe this is that fountain of youth the old spics raved about!'

" 'You must have just come into your second childhood,' I smiled back at him, weakly. He managed to grin and I saw something that startled me almost as much as did the luminous sphere.

"Sands' face was actually clearing! Deep furrowed wrinkles that had marked him as an old man, sun-hardened and leathery, were vanishing from his face! Except for a month's growth of beard, he appeared to have dropped, in those few minutes, many years of his age. His brown eyes that were dim, and watery, were taking on a sparkle that signifies the vigorous health of youth. His bowed shoulders straightened. In spite of the rapid change he was going through, the greenish hue remained to mar his features with a ghastly pallor caused, no doubt, by the radioactive power of the radium. As for myself, I could feel no change in my physical being. I wondered if the great radium deposit was to blame. I knew that science held transmutation of elements possible and has even accomplished it in a small way and that radium itself is the product of disintegration of uranium and ionium.

"For some reason, Sands and I felt better after the hurtling projectile had lifted from the whirling pool and passed into the infinite. After a short conference we decided to investigate the strange phenomenon we had witnessed, and at the same time continue our search for Allie Lane and her father, or whatever traces of them might remain. Our brains were clear as bells now, our wits sharp in spite of so many strange happenings that occurred since early that morning. After it all, we thought, we could not be surprised at anything that might arise in the future, and we might as well explore further, the weird circular cave and the black hole which we noticed still retained its red glow. Sands remarked that if the red glow continued to illuminate the cave from which had come the whirling sphere, there would be no need of the small carbide lamp I had in my pack still strapped to my shoulders. The only thing that seemed to worry us was the absence of water. Our canteens were practically empty and naturally we wanted to refill them if we could. We seemed to have no thirst and a strange comfort appeased the dryness of our throats.

"We single-filed along the edge of the pool toward the luminous red cave. In several minutes we had reached the entrance to our glowing objective. At the entrance of the cave with its glow of red radiancy, Sands and I paused before entering. What we saw there caused Sands to leap backward. I stood stock still, awed at the sight, not knowing what to do.

"On either side of the cave, hung intact, were the skeletons of two human beings! With skulls grinning like green ghosts, the skeletons hung against the side butts of the cave's entrance! Weirdly radiant with the pale green hue, the bones stood out in high relief against the red glow of the strange illumination as though to warn us that to go further meant doom.

"I turned at the sound of Sands' getting to his feet. He stood at my side, mouth agape.

" 'That, pardner,' he said, softly, 'means the end of our search! I have hoped for the best for Allie and her dad, but what we see now tells the story of their deaths!'

"Sands doffed his hat and hung his head in reverence. I did likewise for I was thinking along the same lines. Sadly I lifted my head and again speculated on the skeletons. I was trying to figure who might have hung those grisly relics on the wall of the cavern. Whoever it was, I thought, had scant respect for the dead! The two could at least have been given decent burials. I clenched my fists and swore. Sands lifted his head suddenly at the oaths which escaped my lips. His hand grasped my sleeve.

" 'What's wrong, pardner?' he asked, with a trace of anger in his voice.

" 'I'm just wondering, Sands,' I replied, 'how they came to be hung up there like that. They couldn't hang themselves in suicide and the bones remain intact. Let's look closer!'

"We moved closer to the dangling relics. As I had implied, the bones were linked together with wire and hung against the wall with metal pegs!

" 'The dogs!' Sands hissed in my ear, his voice steady and as strong as a young man of twenty-five. I looked at him curiously and indeed, he was a young man again, save for his whiskers. Strangely, I thought, had we actually come upon the mythical Fountain of Youth that the early Spaniards actually believed existed in one of the Seven Lost Cities of Cibola? Were we about to find, here in Death Valley, one of those seven cities? Hardly! My imagination must be running wild, I thought.

" 'Maybe some prospector had found these deposits, Sands,' I whispered, 'and hung those skeletons there to keep others away. It's not impossible.'

" 'No,' Sands said, 'it's not impossible, but it isn't likely! Skeletons wouldn't frighten a man away from a great wealth like lies here. Your idea don't explain that crazy ball of metal, either. I think there's more to this than shows on the surface.'

" 'Perhaps you're right at that,' I acknowledged, 'but who in hell would want to hang a couple of grinning skeletons out here like that? By the way did you compare the bones?'

" 'Yes, I did compare them and I'm convinced that they are the bones of two men. Neither is a woman! They are not Allie and her father!"

"I felt better at that. Buoyed up by the discovery, Sands' never dying hope that he would still find his lost sweetheart Allie Lane, expressed itself in his features.

" 'And I feel that Allie is alive,' he continued. 'I don't know why I feel it. It might be what we call a coincidence or just a hunch, but I think we'll find her near here!'

" 'Poor girl,' I muttered.

"I expected to find the age-whitened bones of Allie Lane and her father but events seemed to have bred within me a belief such as Sands'.

CHAPTER IV

Into the Cavern

"I FELT that our search was at its end when we beheld the two skeletons, but our observations told us that they were the remains of two heavy-set men, one of whom had the ball of an old time bullet lodged in his right wrist bone. We concluded that they had been a couple of frontier bandits or prospectors who wandered onto the Manalava Plain and died there of thirst. Sands strode over to the wall and lifted a skeleton from the pegs. I watched him with amazement. The rattle of the bones sounded oddly in the crater. He threw one and then the other into the pool. As we watched, intently, the bones slowly sank and vanished until there was nothing left. The stuff must have been horribly thick and viscous to retain it on the surface so long.

" 'That's about the best burial they'll ever get,' he muttered. 'I'd hate to die knowing that my bones would be hung on a wall to frighten folks away!'

"I agreed with Sands. He seemed a different man altogether from the wrinkled old gent to whom I had been accustomed. With many of his years gone, and apparently young again, he was wide-awake to the adventures at hand. Without further words, he strode lightly to the entrance of the luminous cavern. I followed, choosing to be led rather than lead.

"Carefully we picked our way into the tunnel which widened perceptibly beyond the entrance. Inside, the red glow was more pronounced. Sparkling gems, cropping out of the walls, glittered brilliantly under the red radiance. A well worn path led along the center of the cavern's floor and we followed it for perhaps a hundred yards on a downward angle of probably five or six degrees. We observed small caves branching off from the main tunnel, but we continued along the trail of the larger one.

"Suddenly, as we picked our way along the path, we heard the sounds of a dismal chant. Steadily the sound increased. The entire cavern reverberated with the ominous sound and almost from the moment it reached our ears, we found ourselves in total darkness! The entrance of the cave which had previously been open to the sun-light and looked bright and inviting from the cavern's interior, was now totally dark! The inky blackness was as oppressing as the damp, stagnant air was nauseating. I reached out and grabbed Sands' arm so that we would not get separated. At the same time I jerked my gun out of the holster. Sands grunted when he heard the click of the hammer being drawn back under the thumb.

" 'Don't shoot until you're sure what you're shootin' at, pard,' he whispered in my ear. 'I think I hear footsteps off there to the left. Get around me or let me have the hog-laig!'

" 'I hear something in back of me, Sands,' I replied, a little nervously. 'Something seems to be flyin' around our heads like bats but I don't hear the whirr of wings!'

" 'Don't move then!' he advised.

" 'That's a hell of a racket, ain't it?' I remarked, trying to control my agitation.

"We stood closer together in the blackness. The tunnel reeked with an evil odor that was sweet and lung-tickling. I have smelled something like that before in caves where wild cats had holed up, but this was a thousand times stronger.

" 'No use standing here, pardner,' Sands whispered softly, 'I can't hear any more footsteps and the bats seem to have vanished. Suppose you light up the carbide lamp. I want to look around in here but not in the dark. Might fall into a hole!'

" 'Let's stand still a few more minutes,' I said. 'I'm a little uneasy about this. I want to get my bearings for a line on that opening where we came in. Looks like the hole has been closed up.'

" 'That hole couldn't be closed without us hearing it!'

" 'With that noise down below you couldn't hear it anyhow!' I argued. 'Sounds like a pack of demons thirstin' for blood!'

" 'It don't sound any too good, I'll admit that,' Sands acknowledged. 'It might be wind caused by an underground suction, or chlorine gas blowing out of a volcanic fissure. The stink smells like chlorine gas.'

"We peered into the darkness trying to penetrate a solid wall of unfathomable black. My eyes ached under the strain. I removed my hand from Sands' arm to rub them.

"Suddenly a darting light passed like a meteor through the blackness above, showering green, luminous sparks to the floor of the cave! In the brilliant light I caught sight of Sands' features. The expression on his face told me that he had barely missed being struck by the glaring missile. He yelled loudly to drop down flat, as another light in the form of a sphere apparently of molten metal, darted over us, dropping a shower of floating sparks.

"Instantly the meteor-like ball was followed by other bright, swift-moving lights which passed perilously close to us and raced to the end of the tunnel toward the entrance. Their passing was marked by a low, droning hum of a likeness to the drone of the big sphere that had been shot from the whirling column in the center of the pool.

"Lying flat on our backs on the hard lava floor of the cavern back there under the terrible Mana-lava Plains, Sands and I watched the space above us. Closer and closer came a steady stream of brilliant lights that permeated the already nauseating air with the odor of burning carbon! I raised my gun several times to fire at one of the lights but thought better of it until I was sure of hitting the mark. Meanwhile I began to think what might happen should I actually succeed in striking one of them. I asked Sands' advice. He suggested that I try my luck.

"I raised my head a little to look down into the tunnel. Issuing from what appeared to be a deep hole perhaps a half mile ahead, came a spinning ball of glaring fire. It hovered for an instant over the yawning, luminous hole and then darted in our direction at a terrific speed. I lifted my gun from my hip. When the light was near enough, I pulled the trigger.

"The sharpness of the concussion filled me with fear, but in the instant the light was gone. Only a shower of sparks remained to prove that my slug had gone true. The sparks lay on the tunnel floor, glowing like lumps of molten copper, green and red.

"We lay on the ground for several minutes more. Then I nudged Sands. We walked along the path for perhaps a dozen feet and then I realized that our sense of direction was gone altogether. We were completely lost in a strange world of blackness pierced only by mysterious lights and sounds, of whose origin I could not guess.

A Place of Terror

"PRESENTLY we realized that it was folly to wander around when any step might precipitate us into unknown dangers. I had an unpleasant feeling of helpless fear that was gradually overcoming my reasoning powers again.

"At times I looked fearfully to the right and left, but saw nothing but blackness. The glowing remains of the light had long since died out and the cave was once again in total darkness. There was no life, no sound, no motion except for the movements of Sands and me. Allie Lane at that time was very remote from my thoughts. I was thinking of personal safety and although I had some assurance in the feel of my gun in my hand and its effectiveness on the dangerous lights, I was nevertheless fearful. I felt the panic of utter isolation from humanity. I was in a different world entirely!

"Sands suggested again that I get out my carbide lamp. I hesitated, fearful lest our positions be clearly defined in the light, and lay us open to further danger from the fast floating lights and their sources.

"Stagnation—everything sinking and stale! The cavern smelled of sheer funk. It curled our nostrils and nauseated our stomachs to such an extent that I became violently ill temporarily.

" 'Let's get out of here, Sands!' I whispered. 'I think we are headed into the cave and if we turn around we can reach the opening.'

" 'We can try it. I'd like to get a breath of air.'

" 'Hold on to me then,' I said, 'we'll get out!'

" 'Mebbe!'

"With Sands holding onto my arm we turned around and began a slow, deliberate walk back to what we thought was the entrance to the cave, long since dark. For perhaps fifteen minutes we picked our way along the cave not knowing what step might sink us into death.

"Suddenly I collided with a solid wall. Around the edges the sunlight of the outer world flickered and I knew that it was the entrance to the cave.

"We were stunned when we discovered that the entrance had been closed solidly with massive slabs of rock! The air was less heavy and stagnant here and we sat down after a strenuous effort to roll back the rock wall that trapped us. We rested, motionless on the floor of the cave. I could not see Sands but sounds of his heavy, even breathing came to me. We were too exhausted even to speak but I suddenly felt the pangs of hunger.

"I slipped my pack from my shoulders and felt within it. I handed Sands several squares of hardtack and a bar of chocolate for which he mumbled his thanks. Ravenously I devoured my ration; then got out my carbide lamp and toyed with it.

"As I sat I noticed that the low moaning sounds

that we had previously heard were again issuing from deep within the cave. I shuddered. The sounds beat terrifically on my brain and in my terror I drew my gun and fired four shots rapidly toward the interior.

"Instantly the hole was a bedlam! I leaped to my feet to run but tripped over Sands' outstretched feet and tumbled to the floor.

"'Take it easy, pardner!' Sands advised, softly, his voice quivering. At his calm words I lay down quietly.

"You cannot conceive my terror. Could I have but known the reasons and the causes for the many things we had seen and the incidents that happened, I would have been better able to control myself. Terrified, I lay on the floor of the cave and it was a long time before I was able to think. Meanwhile the cavern was in pandemonium. The moaning sounds had again become a wail which gradually developed into high-pitched shrieking. I expected momentarily to see another huge whirling sphere shooting toward the entrance of the cave where we lay panic-stricken.

"To my horror, the cave began to lighten with the green luminous glow, and a score of yards beyond I saw what appeared to be a sluggish red stream, thick and mucky, flowing toward us. I kicked at Sands to draw his attention to it.

"'I see it, pardner,' he whispered. 'What do you think it is?'"

"'Lord!' I answered. 'If I only knew!'

"'Let me have your lamp. I'm going to take a chance on lighting it. We've got to get out of here!'

"My blood turned cold at the mention of the carbide lamp. For the first time I learned that it was not in my hands! At my attempt to run, I thought I must have dropped the lamp with my pack. At any rate it was gone! We crawled around the floor of the cave hoping to feel it. The murky green glow in the tunnel did not help us any at all. It only added to the disguise of the cave's interior.

"Sands cursed me for a fool at allowing the lamp to drop from my hands, leaving us without a means of penetrating the darkness. My pack, which I had placed on my knees before me, when digging out our rations, was gone likewise. Nowhere could they be found. We searched the floor of the cave minutely in the sickly green light but without success.

"Suddenly the cave became brilliant with light. The suddenness of the change from darkness blinded my eyes and instinctively my hands shot up to cover them. It stunned me for a moment and then I looked around.

"I stared incredulously at the sight; then turned to look at Sands. He was poised on his hands and knees, stopped by the sudden light, in his search for the lamp and the grub pack. His mouth hung open. I looked up again.

Strange Beings

"STANDING around us in a circle stood a score of the strangest man-like beings I ever beheld. They stood motionless, surveying us. Towering high above Sands and me, the strangers looked down through great eyes that blinked slow and deliberate like owls' orbs in the night. Instinctively my hand shot down to my gun butt. When it neared the metal it stopped and I jerked my hand away. The gun seemed charged with powerful electricity! I managed to grin foolishly under the glare of two-score blinking eyes. Then I made a careful appraisal of the beings surrounding us.

"Tall in stature—probably seven feet high, they towered above us. With great heads void of hair, powerful bull necks, barrel chests and long skinny limbs that appeared to be of rubber like the tentacles on the weird cactus back on the Manalava Plain, the creatures to the human eye, were repulsively grotesque! Their arms, thin and sinuous, like their legs, seemed of rubber and they hung motionless at their sides. I looked for hands. There were none. At the ends of the tentacle-like arms, there seemed to be sucker-like cups like the end of an elephant's trunk!

"For several moments they stood appraising us. Likewise we studied them. I noticed that above their heads waved two thin, flexible tubes that curled at the end and were attached to the brows just above their owlish orbs. Like the antennae on a desert butterfly, the tubes twitched this way and that! The absence of ears at the sides of their flat heads added bestiality to their repulsive features, and their mouths, like the jaws of a toad, were pointed and bony! Each had the face of a frog and all looked alike except that the creature standing nearest to me and in front of the rest, was perhaps a head taller. He wore a brightly-hued belt of metal around his narrow, skinny hips.

"The big fellow's tubes at his forehead were waving nervously. I stared at him blankly for I had a peculiar feeling that somehow he was trying to speak to me. I shot an inquiring glance at Sands. He was still in the same position. His knit brows displayed a growing uneasiness. Surely, I thought, these grotesque fellows were not hostile, otherwise they would have made short work of us!

"I crawled slowly to my feet and stood erect in front of the repellant fellow, who was apparently the leader of the frog-featured beings. His green, luminous face was tilted down to me and from it radiated the warmth of radium. He towered three heads above me and I felt like a pigmy beside him and equally as helpless.

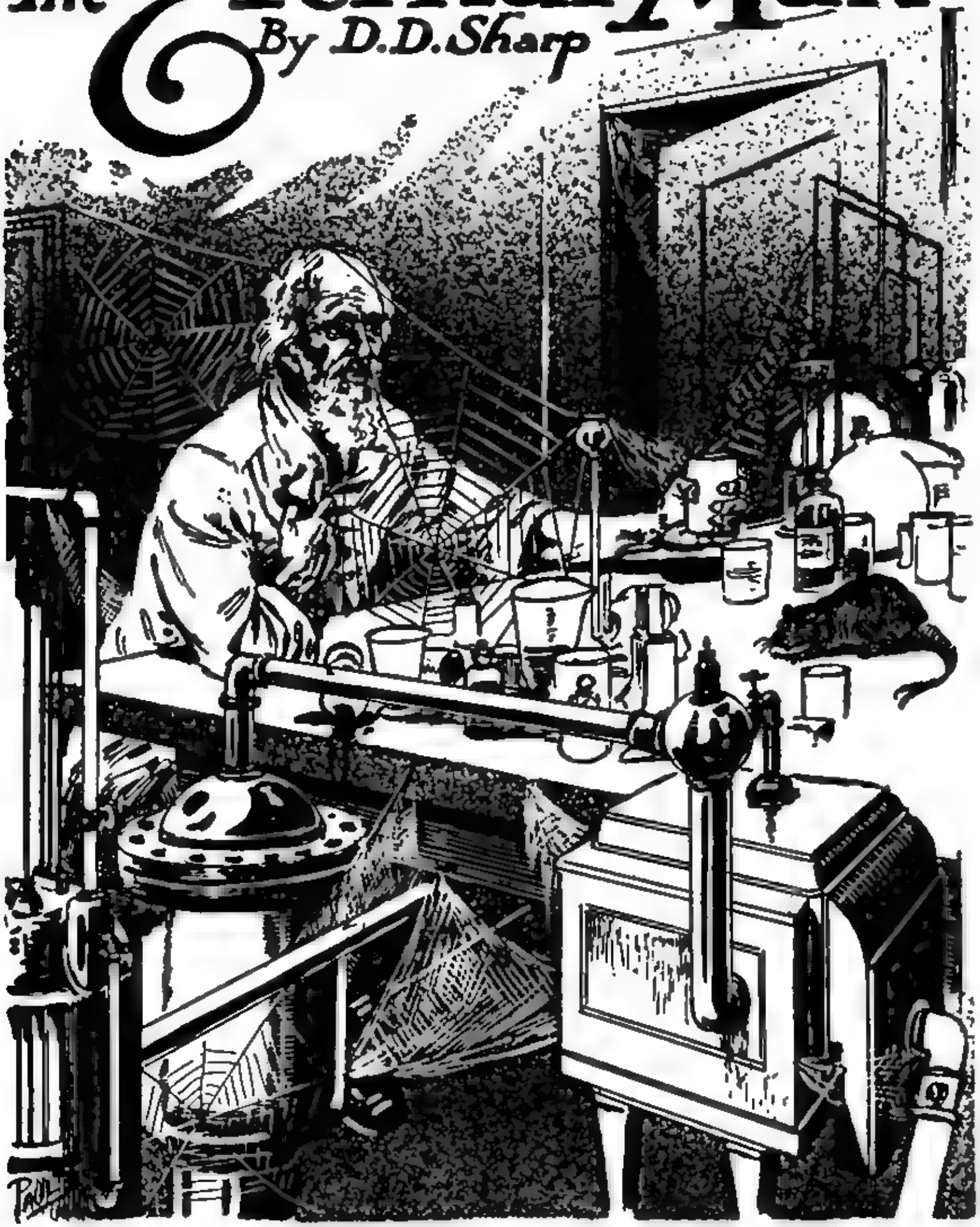
"'Well——,' I managed to say, in astonishment.

"His tubes stood out stiff and motionless. A strange power seemed to be penetrating into my crazed brain and his attitude made me feel that he was reading my thoughts. Suddenly my brain was struck with a direct question, although I heard no voice.

(*Continued on page* 273)

The Eternal Man

By D.D. Sharp



Old Zulorich grew no older. And in the dead of night the rat, with its eternal life, would come upon the table and stare at him with red spiteful eyes; while Zulorich sat as stilly as though sculptured in stone.

The Recluse

HERBERT ZULERICH was a big, heavy-framed man with a tangled mop of shaggy hair which lay back from his sloping forehead and clustered about the collar of his dark coat. His nose was big and prominent, swelling like a huge peak upon his face, and his mouth was a deep-lined canyon between the peak of his nose and the bulge of his chin.

Zulerich's habits were as strange as his face, and ponderous as his big body. How he lived no one knew, and no one knew either how he managed to maintain the formidable array of test tubes, and retorts. In his laboratory was every conceivable kind of peculiar glass, holding liquids of all colors.

Zulerich had, at one time, been a chemist of somewhat more than local fame, but of late years he had become a recluse, staying alone most of the time in his big stone house just back of the highway where the constant stream of autos seemed to disturb him but little.

In truth they disturbed him a great deal. Some days he would watch them in their hurry as they drove furiously along the straight line of paved roadway, and into his face would come gloom and melancholy. And into his large blue eyes would come a hurt look; a feeling of sympathy for those who seemed so full of life, so gay, so thoughtless.

"Death! Death!" the old man would whisper, "Man goes through long years of preparation for the few days of accomplishment before the conqueror destroys all."

"So much preparation," he would whisper as he shook his big head. "So many brilliant minds polished and blazing for an hour, like roses grown and tended to be cut for an evening's bloom; hands so skillfully trained, and so soon folded quietly at rest."

That he was in quest of some great secret, everyone who knew him had long ago suspected. But what that secret was, no one knew and few could even guess.

The truth was that Zulerich's mind was obsessed by a single thought—the appalling waste of death. And since science and invention were conquering the other enemies of man's existence, Zulerich set out after the example of Ponce de Leon, to discover the elements which might be combined to give eternal life.

Strange as it may seem, Zulerich was making some progress. He had found out some things which had astonished him. Some of his experiments had awed and stupefied him, and then he made a discovery which gave him a decided fright.

He had been experimenting with unicellular organisms, and had found that they did not behave as inorganic chemicals did. He knew that the reaction of those animalcules was distinctly physiological and not merely physical, organic and not purely chemical. They did not resemble any known chemicals, for they reacted as individuals and not as mere materials. This discovery, he found, was confirmed by Jennings in his book "Behavior of Unicellular Organisms."

D. D. SHARP

Old Zulerich had studied the intricate processes of cellular division and multiplication, hoping to penetrate the law of the organism and discover something of the life it maintained. He wanted to discover what it was that, at the peak of growth, prevented further cleavage of cells. In short, he wanted to find the principle which confined the limits of size and growth. Find what it was that caused the cells of a living body to increase and multiply until maturity and then cease growing except when incited by a cut or other accident to the tissue. Why should a cell become active to replace wounded flesh, yet balk at rebuilding vital tissues, such as the lungs; or refuse to replace a lost tooth more than once.

He experimented in numerous ways to provoke cell growth, trying to divine whether they had individualities of their own or whether they were bounded by the individuality of the whole. He wanted to find whether cells had an intelligence which caused them to do the remarkable things necessary to their coordination in the body.

Zulerich found out many things; stupendous, mystifying things, which no amount of scientific theory could possibly explain. He perfected chemicals which applied to a rabbit's head caused its hair to grow so long as to make it necessary for him to gather it into a bag. And even then the weight of it grew so great the rabbit could no longer drag its load and he killed the animal out of mercy. But still its hair grew and grew. His high-walled back-yard soon held some monstrous freaks from his chemicals; dogs with heads as big as water barrels and bodies of normal size, and rats with bodies as big as cows and small peanut-sized heads. And one day he ap-

THE present story is perhaps the greatest short science fiction story of the year. If it had been written by H. G. Wells, or Edgar Allen Poe, no one would question its greatness, but coming as it does from a new author in science fiction, it must be hailed enthusiastically by every true lover of this type of story. The editors found themselves reading and re-reading this little gem a number of times—it is so good.

It is one of those stories that will cause a great deal of controversy from our readers; but if the editor knows anything about their likes and dislikes, we certainly predict one thing—and that is, the story will be universally liked and discussed.

plied a chemical to a horse's eyes and the eyes grew out of their sockets like long ropes of white sinew with great knobs of gelatine-like iris—limp flabby canes which dragged upon the ground. The effect of this last experiment so cut the kind soul of Zulerich that he killed the monstrosities and wished to abandon his whole business. Then he would look again from his window over the wide world where death laid waste, and he would sigh and tighten his lips to plunge ahead again.

Growth was not what Zulerich wanted. He was quite content that man should retain his present stature. What he desired was to increase man's years.

And then he discovered it. He did not need to prove the experiment by waiting and watching until the end of time to find out whether the cells would eventually die. He knew they would not die. A few drops of pale green fluid in the graduating glass in his hand would permit any man to live eternally. He knew this was possible for he had at last found the combination he sought; the chemical which continued life without the necessity of decay.

The Elixir Found

AFTER a year of experiments upon his cells he tried a drop upon a rat. He caught the rat in one hand and held his medicine dropper with its pale green fluid in the other. But, as the dropper released its globule, the rat moved its head and the drop hit the side of its face and trickled down and spread about its throat. It left a scar upon the hair, a peculiar scar like a question mark. Zulerich tried again with a second drop with better success. The rat swallowed it.

Zulerich watched carefully. The animal's heart seemed to cease beating. The lungs became motionless, and yet the rat lived, with a fire in its pink eyes. It lived on, day by day, week after week, month on month, without the slightest loss of weight or sign of hunger or thirst. It lived with its tiny soul imprisoned in it.

Yet even then Zulerich dared not drink his elixir, though his work was exhausting his strength and his heart was very weak and with its flutterings gave him frights at times. There was a flaw in his experiment. The animal lived without breath, food or water, but it was entirely *unable to move!* To see it one would presume it dead, except for the fire in its fierce little eyes and its lack of decay.

So Zulerich set out to mend the flaw. He worked feverishly now, for he was a very old man and his heart threatened to fail. He did not want to die with success just within his reach. He did not want to come so near offering mankind the one boon it craved and then to fail.

Two years passed before Zulerich found the ingredient lacking in his pale greenish drops. The thing was so simple he had overlooked it altogether. He discovered it quite by accident.

One day he had a pail containing a solution of washing soda near the window and was washing down the dusty glass so that he might see out over the blighted world and gain strength from its curse to continue his work. He would allow no one else in his laboratory and washed the windows himself.

A few spattering drops fell into the motionless, upturned mouth of the rat where it stood upon the deep casement. Its mouth was open in the same position Zulerich had left it when he had forced it to receive the life preserving drops. It had stood a tiny, paralyzed, living statue in that same attitude for two long years. Zulerich had really thought to remove the animal from the window before beginning to wash them. But as he grew older he had grown more absent minded. He was unable to use the same care and forethought he once had; but this time his carelessness resulted in a great discovery.

Immediately when the soda dropped into the rat's mouth it squealed and scurried for cover. But it soon came out to nibble a crust of cracker the parrot had dropped upon the floor.

Zulerich had been overjoyed at the rat regaining the use of its muscles, but now he became worried and anxious because it developed hunger. He thought that hunger might forebode decay which meant death.

Even as he pondered he trembled, for he knew he was very old and had not much time to watch and wait. And then as the result of his suspense and relief over the new discovery of the soda drops, his heart began fluttering alarmingly. It acted as it had never done before. He thought his time had come to die, and his precious experiment was almost completed, perhaps perfected, but not yet given to a life-hungry world.

All the legends he had ever read of the discovery of elixirs of life had had their fruits frosted just before the eating. And so it seemed it was to be with him. This was the end. Then he thought of his drops! He would drink them and there would be ample time to conclude his experiment.

He stepped quickly over to the table and sat upon his high stool. Then picking up the vial of pale green, which had become dusty with its long idleness upon its shelf, he measured his drops. But his hand trembled so that the vial dropped to the floor and spilt its precious fluid. He drank the drops in the measuring glass Then he reached for the soda water sitting just at a touch of his hand.

The Living Corpse

HE could not move! He had forgotten he would be unable to hand the soda to his mouth. For the moment he was too upset and frightened to think clearly. He had overlooked a very vital thing. There was nothing to do but sit and wait for a neighbor to pass. He was as immovable as though cut in stone. He could not move an eyelid. He was very frightened.

A week went by.

During that week the rat played all over the room. One time it came out mockingly upon the table before him. Zulerich regarded it closely. It was not breathing.

Another week passed before anyone came into the house. During this time the rat became bolder and Zulerich had much time to observe it. He knew his

experiment had been a success. The rat only consumed food to replace its physical energy. It needed fuel for running about the room, which of course was a method of decay. The rat needed no food to support its life. Zulerich knew he had discovered a great secret. He had accomplished life perpetual which only needed food for its physical energies.

Then a neighbor peeped in. His look of uneasiness gave way to one of pained sorrow. The neighbor's face became melancholy as he saw old Zulerich sitting stiffly upon his stool beside his chemicals. Zulerich tried to cry out, but his voice like his limbs was paralyzed. He tried to croak, even to whisper, but there was no noise at all. He put his appeal into the fierce, cold fire of his living eyes which were turned straight toward the door. The man saw the eyes, bright and living. He slammed the door and fled the room.

Zulerich created quite a sensation after that. No one knew what had happened to him. They thought he was dead, and surmised that he had spilled some mysterious compound over him which had embalmed him with the look of life still in his eyes.

Undertakers came from long distances to study him as he sat in his laboratory. They pried and tested among the fluids in the bottles, and years passed, and still old Zulerich was not buried because they believed he had found some marvelous embalming fluid and he was kept for observation.

Old Zulerich, growing no older at all, knew all this, for he sat there, in a glass case now, and heard all they said and saw before his eyes all that was done.

And in the dead of night the rat with its selfishness and its eternal life, and the unselfish chemist in his glass case, would meet again. The rat would scamper lively across the top of the glass case in which Zulerich sat as stiffly as though sculptured in stone. It would sit upon the table before him and stare at him with red spiteful eyes, and then scamper away. And Zulerich always knew it by the peculiar scar upon its neck. The rat knew what he lacked. For two long years it had been frozen, as he was now, before he had given it movement as well as life. But it was too mean to do so great a deed to a man. It hated him. It never brought him the few drops of alkali he craved.

One day they packed Zulerich carefully in a case and moved him, and when the case was opened he found himself in a lofty building with the mummy of a Pharaoh one one side of him and musty relics of other ages all around him. He recognized the old building, for in the other days he had loved to potter around there and let his fancies wander and his thoughts seek something tangible in these fragments of a vanished age.

As he sat there upon his stool, protected within his glass case, the unalterable line of his vision vaulted the narrow aisles below him and gazed through the great glass of a tall window in the opposite wall.

Out there he watched the throngs that passed. People of a day. Men who yesterday were babes in mothers' arms, today fighting up the long and difficult ladder for their fragment of success, to leap tomorrow into oblivion at their allotted rung.

Customs changed, women scrambled with the male, and there became even less time or inclination to enjoy the fruits of preparation. The years of training lengthened.

In all the years upon the earth it was bound that the two should meet again. The rat with its selfish greediness and the chemist with his unselfish dream. The rat had been seeking him so that it might gloat over him as it used to do. So that it might scamper upon his case and deride him with its motion. But the keeper of the museum saw the rat and beat it with his broom and mangled it with his big leather-shod heel. This happened in the night and he left the rat upon the floor until morning so that the cleaners might take it away.

Before the cleaners came the next morning one of the scientists who were studying Zulerich saw the rat lying there upon the floor before the case with its mangled body and its eyes were so bright and full of pain. He stooped to examine it, and his interest became intense, for its heart and lungs were quiet and it seemed quite dead, and yet its eyes had the same living look of the man Zulerich in the glass case.

So the rat, too, was placed under observation and set in a tiny case upon a perch just before the case in which sat old Zulerich looking out upon the great world through the big window. The rat in its case cut off part of the vision of the chemist so that in seeing the world beyond the window he must look straight into the eyes of the creature to whom he had given eternal life, and which had been mangled until it was given eternal pain.

The years passed on, long years, all the longer that there should be no end of them. It was all the sadder that, instead of viewing the misery and waste of eighty years, he must watch it for eight hundred years, and even then be not done.

Life streamed by under his gaze, burning up with decay. Yet he held the secret they so much desired. Between them and eternal life was a connecting link, a few drops of alkaline water. The wires of communication were down and none had the wisdom nor the wit to raise them up. He had the secret, they had the power, if they only knew.

Eager, anxious, weary, discouraged and broken, the people of the world tramped by; torrents of wasted motion. For long years he envied them, of all that waste, the power to say one small word for their freedom. For long years the undying man and the undying rat stared hatefully at each other. For long years he studied and contrived within his mind some means for breaking the paralysis of his body so that he might given eternal life to humanity. Then he learned a great lesson from a small child.

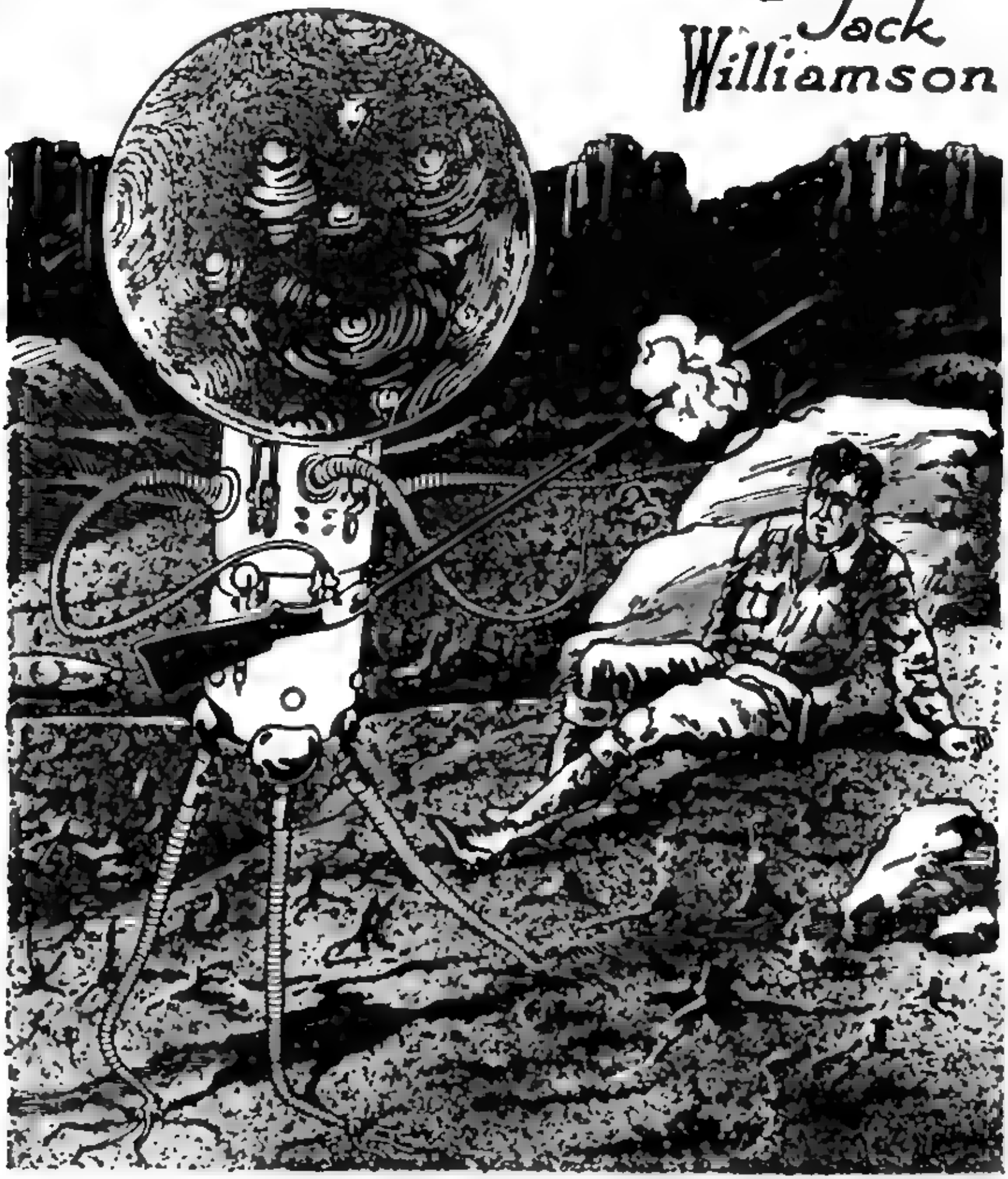
The child had discovered the mangled rat and had seen the pain and desire of death in its eyes. She begged her father to kill the little rat as he had killed her little dog after a car had wounded it.

That night Zulerich's eyes softened as he regarded the rat under the bright glow of the electric lights, and in his heart felt remorse. For the first time he was glad that he had not been able to give man his magic formula. He discovered that he should need to improve life before trying to lengthen it.

THE END

The Alien Intelligence

by Jack Williamson



It was holding my rifle, turning it and feeling it with its slender finger-like tentacles. When the gun went off, it took a grotesquely half-human attitude of surprise.

What Has Gone Before

WINFIELD FOWLER, a young American living in Perth, Australia, receives by radio a number of messages from Dr. Horace Austen, a well-known scientist who is his friend and benefactor. Austen has gone to explore the Mountain of the Moon located in the great Victoria Desert. He urges Fowler for the sake of mankind to come to him and bring some scientific equipment. He gives Fowler the directions and tells him to look up Melvar, "maiden of the crystal city," who he left near the Silver Lake. Fowler goes off in search of Austen. Coming to the desert he finds a great metal ladder with which to ascend to a plateau and then on the other side another one going down into the valley. On the way down the ladder he notices queer lights playing through the valley, and great shapes swimming through the night air. He meets Melvar, of Astran, the crystal city, and falls in love with her. She conducts him to her city, which is the ruin of a once great civilization. Although the Astranians possess great supplies of precious jewels they had a very low material existence, not even having the knowledge of making fire. They are superstitious and fear the Krimin, which are the flying lights that Fowler saw. She conducts him to the city, where he finds that he is not welcome. Austen who preceded him had told the people much of the world beyond and attempted to destroy their superstitions. But Melvar puts him in a place of safety and brings him a letter that she had been holding from Austen. He tells of having investigated the Silver Lake (the touch of whose liquid means death) and believes that many strange things are occurring in this country. He is going beyond the Silver Lake to the crater of the Mountain of the Moon to see what he can discover. Several days later Melvar's brother Naro brings Fowler a note that Jerak the high priest of Astran is going to make a sacrifice of her. She confesses being in love with Fowler. He and Naro rescue her and the three escape from the city. They reach the shores of the Silver Lake where Melvar tells Fowler of the Purple Men, who are beast-like men with the strength of a number of ordinary humans. On the shores of the lake they witness a terrible sight of a great bar of metal formed in the sky and from it drops to the lake great globules of the metal. Fowler concludes that from this metal the lake was formed. But he is mystified about the process taking place in the sky. They go on in search of Austen and are followed by a Purple Man, whom they kill only after literally filling him with bullets. Then one of the ships they use (that of the flying lights) settles down to earth and a half dozen of the Purple Men come after the three. But the red hot ship has set the land between them on fire and the mad-men plunging through the fire are burnt to death. Fowler also kills from the ship a strange looking green animal that when shot gives a little puff and disappears. The three enter the ship and Fowler examining it discovers that it is a rocket ship which uses the decomposed metal of the Silver Lake as a means of propulsion.

Battle In the Air

I RETURNED to my experiments with the lever. The control was relatively simple. The vessel was propelled forward when the lever was pushed forward, and reversed when the lever was pulled back. Slipping the little disc up or down raised or lowered the prow, and twisting the thing accomplished the steering in the horizontal plane.

By the time my cautious experiments had revealed all of that, Melvar had pointed out three slender crimson craft, wheeling low about us, and evidently preparing to land. I pulled the knob up, and pushed it forward all the way. A pale red beam shot ahead. The black landscape dropped away from us, and we hurtled through the air of the night. I was amazed at the lack of any great sensation of motion, and that the jets of gas, for all their appalling roar without, were barely audible within the cylinder. Still the fore part of the ship was transparent from within, so that we had the oddest sensation of floating free in space.

I saw that the three ships had fallen in a line behind us, and were following at the same terrific pace. When we had reached an altitude of perhaps a mile, I twisted the knob to bring the helm about, and we shot over the Silver Lake, which lay like a white desert of moonlit sand beneath us, standing out sharply against the dark plain around it. In a moment we had gone over it, and over the low hills beyond, and into the bank of purple mist. I had hoped to have time to land and have the vessel on the ground below, but I looked back and saw that our pursuers were gaining swiftly, and that slender twisting rays of bright orange and green were darting toward us from the hurtling arrow-like ships of red.

JACK WILLIAMSON

In the darkness and the mist we could see nothing of the ground below. The only visible things were a few mist-veiled stars above, and the bright scarlet torpedoes that shot after us. Quickly I circled and raised the helm. I was almost intoxicated with excitement, and the indescribable sensations of our swift and lofty flight. I felt released from all the weaknesses of the body; I felt as if I had conquered the force that holds all men to earth. I felt a new and wonderful sensation of freedom and power. I had but to move the little piece of metal in my hand to go where I pleased with the speed, almost, of light. But still came the line of ships behind us, at an incredible pace, stabbing at us with the green and orange rays.

Then, high above the others, I brought the ship around in a hair-pin turn, and plunged directly at them. They tried to turn aside, while their rays shot thickly toward us, but our speed was too great. The foremost suddenly turned broadside toward us, attempting to get out of our path. I held our bow directly at it;

WE are certain that the first installment of this most extraordinary science fiction story must have impressed you; but the best part is now before you. It has always been a source of wonderment to every scientist and to most philosophers, why intelligence and reason such as possessed by human beings should be found only in the human race. There certainly seems to be no good reason for this. In fact, it would seem rather obvious that intelligence such as we know it, should be common to other beings of our own world as well as to other worlds.

At any rate, the author in the concluding chapters gives us a good deal of food for thought on this subject, and in addition keeps our imagination and interest at a high pitch of excitement throughout. It is an unforgettable story; one that should live long in the memories of every science fiction lover.

raised it a trifle at the last instant. The keel of our vessel struck the other amidships. The terrific crash of the collision hurled us to the floor.

When I regained my feet we were falling in a crazy twisting path, our ship altogether out of control. No sooner was I on my feet than the floor tilted up again and I fell back to my hands and knees. I saw that the one we had struck was broken in two and plunging toward the earth far behind us, while the other two were circling about, far overhead. The mist about us grew thicker until the other ships, and the fragments of the wrecked one, were strangely colored purple; thicker still, until they vanished. We floated in a world of purple fog.

I seized the control lever as soon as our wild gyrations enabled me to reach it, but my unskilled efforts only resulted in making us roll and twist more wildly. So long as we had been on an even keel the piloting had been easy enough, although I imagine my success in ramming the other ship had been largely due to luck; but the blow against us had been sidewise, setting the ship to spinning like a top. It seemed that we fell an interminable time. Whenever the stern pointed downward for a moment, I pushed the lever forward, to check our fall as much as possible.

Through the mist I suddenly caught a glimpse of the dark ground below. In another instant the vessel had struck heavily, throwing us against the floor again.

Day was beginning to break at last, and we could see that we had fallen on a bare, gravelly hilltop. The clear space was only an acre or so in extent. We were shut in on all sides by a dense, dark forest of gigantic trees, that rose threateningly, seeming to grasp us, to close in on us. The purple mist hung in a sombre curtain overhead, only faintly lighted by the coming day.

The Silver Falls

NARO and I strapped on our packs, picked up our weapons, and opened the door. The three of us stepped out to face the perils of another world. What they might be, we did not know. I had no idea, even, what part of the country was inhabited by the *Krimla*. But Austen had not let himself be conquered by the mere strangeness of the place. I still hoped to be able to find him, although a search in such a jungle as that about us seemed hopeless.

The walls of the rocket ship were still glowing dully red with the heat of its passage though the air, and we hurried away over the gravel for fifty yards, to get beyond the fierce heat it radiated. The patch of sky above was a dull, dusky, luminescent purple. It seemed almost as if the mist shut out the daylight and lit the valley with a weird radiance of its own. All about us towered the forest. As the light grew better, we could see that the trees were red. They bore the same feathery fronds, the same star-like flowers of brilliant white, and the same golden-brown fruits as the plants of the plain about Astran. But they were immensely greater; they towered up hundreds of feet. It was like a forest of the tree-ferns of the Carboniferous period, save for the deep bloody scarlet of the leaves. In fact, I think the red plants are descended from some of them, strangely developed by the unusual climatic conditions of the crater, or by the purple mist.

The ground all about the gravelly knoll was low and marshy, and the air was heavy with the odors of rotting vegetation. There was no wind; and the air, under the great atmospheric pressure, was heavy, moist and hot. It was oppressive. It hung like a weight upon our chests. And the crimson jungle seemed to possess a terrible life and spirit of its own. It did not belong to our world.

The undergrowth was very thick. The higher branches were dimmed by the purple mist. They seemed almost to reach the heavy, dull purple sky. It appeared useless to try to penetrate it. It was an evil being waiting to seize us the moment we crossed its bounds.

I got out my compass, and we decided to try to make our way toward the north, in the direction of the pass by which we supposed Austen to have rounded the Silver Lake. As I had last noted our position above the mist, with reference to the lake and the crater walls, we had been about fifteen miles south of the pass, at an estimate. I hoped, by taking a course in that direction, to come across some trace of Austen.

As we approached the north side of the clearing, I made a startling discovery.

In the side of the hill was a deposit of iron pyrites. Not that there was anything remarkable about that. But the thing that struck me was that the vein had been recently worked! I sprang down in the pit and found on the rock traces of copper that had evidently come from soft copper tools. I knew that Austen would have needed minerals, that, indeed, if he had set up a wireless outfit in here, he must have been compelled to do an immense amount of work in collecting and refining the needed materials. I had little doubt that he had been there, but it had been evidently weeks or months ago. Any trail that he might have made through the forest would have already grown up.

I thought the situation over for a while, but still there seemed nothing better to do than to follow our original plan of exploring the jungle to the north. We plunged into the crimson gloom. Without the compass we would have been quickly lost. Even with it, it was hard enough to keep in the same direction, walking over the marshy, sodden ground and breaking a path through the heavy undergrowth. We were soon covered with mud and dyed red with the stain of the weird vegetation.

For many hours we struggled through a wilderness of endless sameness—a dank morass, a crimson jungle, with the dusky purple sky hanging heavily in the treetops. The bloody scarlet gloom was startling and terrible.

At first the forest had been quiet, with a silence that was dead and depressing, for there were no living things about us. No birds, no insects—not even a bright moth or butterfly. It was a wilderness of death. But presently we heard, far ahead of us, a dull, constant roar, that grew ever louder as we went on. I supposed that we were approaching a great waterfall. At last it grew so loud that we had to shout when we wished one another to hear our words. I was glad of the roar, for it drowned the sound of our progress through the jungle. But the forest was so dense that there seemed little danger of our capture unless we stumbled unaware on the habitation of the *Krimla*.

Abruptly the jungle ended, and we stepped out on a bare ledge of stone. Before us was one of the most magnificent spectacles that I have beheld. To the west of us a great black cliff rose perhaps a thousand feet—until it was almost lost against the lowering, smoky purple of the sky. Over it plunged a vast sheet of the glowing white liquid of the Silver Lake, falling in a gigantic unbroken arch to the immense pool beneath us, where it broke, with a deafening roar, into a gleaming bank of soft silver haze. Surrounding the black rock rims of the pool, the gloomy crimson of the forest closed in. The pool was a thousand feet across. The whole scene was colossal; it was awe-inspiring and impressive for the strangeness and intensity of its color.

There was no visible outlet for the silver liquid; so I knew that it must find its way off underground. I knew that we must be far below the level of the Silver Lake and the plain beyond. That fact may have accounted for the more luxuriant growth of the red vegetation.

Suddenly Naro reported the discovery of the comparatively fresh print of a hob-nailed boot in a little patch of mould on the rock. That set us to looking again for traces of Austen, and presently we found a fairly well-defined trail that led off to the east. We followed it eagerly. When we had gone perhaps a mile we came to an outcropping seam of coal. There I found the plain marks of a copper pick. Evidently a good deal of coal had been dug up and carried off down the trail.

CHAPTER X

Austen's Retreat

PERHAPS two hundred yards farther on we came to the camp. It was on a little hilltop below a giant tree. By the trunk was a little mud-daubed hut, with an open shed in front of it. By the shed was a rude clay furnace, with piles of coal, some strange ore, and large lumps of native copper lying by it. Beneath the shed was what appeared to be a small steam turbine, with a kettle-like boiler of hammered copper. Connected with it was a dynamo of crude but ingenious construction. Also there was a rude forge, and hammers, anvils, saws and drills, all of copper or bronze, and a device that I supposed had been used for drawing wire.

Simple as it seemed, that camp of Austen's was perhaps the most remarkable thing I came across in the crater. Austen was a wonderful man. Having not only an exhaustive knowledge of a half dozen fields of science—and he had not mere theories, but a practical, working knowledge—he had also courage and determination, patience and manual skill, and a great deal of resourcefulness and invention. While the average man would hardly have been able to keep alive in the jungle, Austen was able to do such things as smelt and refine ore, and set up complicated and workable electrical machinery. Of course he was fortunate in finding himself in a place where practically no effort was needed to satisfy his physical needs, and where he found various natural resources in available and easily accessible form. But I shall never cease to wonder at his accomplishments of less than a year.

I was struck by a sudden fear that we had come too late, and that something had happened to him. "Austen," I shouted, "Austen, are you here?"

For answer, an old man whom I recognized joyfully as the old scientist appeared in the rude doorway of the hut. His clothing was tattered beyond description, and he looked very worn and thin. There were lines of age and care about his wrinkled face. But his hair was neatly brushed, and he had just been shaving, for his safety razor was in his hand. A smile of astonishment and incredulous joy sprang over his face. For a moment he was speechless. Then the old familiar voice called out uncertainly, almost sobbing with joy.

"Winfield! Melvar! Naro! Can it really be you? At last!"

Then, as if he were a little ashamed of the feeling he had shown, he pulled out his pipe and began to try to fill it, his fingers trembling with emotion. But Melvar sprang to him and threw her arms about him in a way that gave me a momentary pang of jealousy. He stuck the pipe back in his pocket, grinning awkwardly, in a way that tightened the strings of my heart.

"I forgot," he said. "My tobacco was all gone a week ago."

I shook his hand, and it clung to mine for a moment as if he were seeking support. Then Naro placed his palm upon Austen's shoulder in the customary greeting of Astran.

"I'd almost given up," the old man said. "The world is so far away that it seems almost unreal. After I had sent the wireless call a few times the devilish rustling in the sky got too close for comfort, and I decided that the hissing red lights, whatever they are, were about to locate me by the signals. So I quit that. But how did you come over?"

I told him briefly about the adventure with the red ship.

"Yes, I knew that the things were ships of some kind," he said when I had finished. "I have been working on the quicksilver stuff, and making a few

exploring trips. I have discovered several things. I had to work—to work endlessly—to keep going. Sometimes I got to feeling pretty low. Then I would shave, and try to clean up like a civilized man. And I kept repeating all the poetry I knew—that helped a lot. But Lord—you haven't any idea how glad I am to see you.—By the way, did you bring the spectroscope and tubes?"

By way of reply, I took off the pack that contained them. He began to open it with as much enthusiasm as a small boy investigating a Christmas present. Suddenly he paused and looked at us. "But you don't look like you've had any holiday yourselves. What has happened to you?"

"Two or three things," I told him. "It hasn't been a holiday at all. Do you happen to have any coffee left? I left mine in the tent outside the cliffs."

"And how about a little hot Mulligan stew to go with it?" he grinned, beckoning the way inside.

The Scientist Speaks

So we went into the cabin. Most of the room seemed to be devoted to his crude laboratory equipment. On one of his benches were several roughly modeled pottery jars, filled with the liquid from the Silver Sea. His bunk was in a screened off corner.

In a few minutes he had the coffee-pot boiling over a charcoal brazier. I believe that aroma is about the most pleasant that ever reached my nostrils. I was too much absorbed in it to do much talking, but Melvar sat down on one of Austen's rustic stools and gave him an account of our adventures.

When the coffee was done, Austen served a meal consisting in addition of a great pot of steaming soup made of the yellow fruits cooked with the tender roots of the red plants. That stands out in my memory as one of the truly magnificent repasts that have ever been laid before me. When we had finished Melvar retired to Austen's bunk, and Naro and I lay down on a blanket on the laboratory floor. I went to sleep at once, and, if I may credit the word of our host, slept for thirty-seven and a half hours. Although I am inclined to believe that is an exaggeration.

At any rate, when I got up, I felt a new man. Austen had set up the apparatus we brought. He had a test tube full of the silver liquid set up in a beam of X-rays, and the spectroscope in position to examine the dense purple gas that was rising from the stuff.

"How is it coming?" I asked him.

He shook his head sadly. "I don't know," he said. "I have a theory, but it doesn't seem to work out right. The key is in sight but it always eludes me. There is energy stored in the silver liquid. It may be that that amazing thing in the sky stores the energy of sunlight in the stuff. You know that the energy in sunlight amounts to something over one horsepower for each square yard on which it falls. Or perhaps the atomic energy of the gases in the air is released. It seems impossible to find the key, although I have been able to analyze the stuff pretty accurately. If I had it I could make the silver stuff go off like ten times its weight of T.N.T."

"Do you think," I asked him eagerly, "that you could set off some of it and wipe out the *Krimlu*?"

"Winfield," the old scientist soberly replied, "even if you could, would you wipe out a whole civilization—a science so high as that which made the Silver Lake—a culture equal to, if not above, that of our own world?"

"If you had seen those purple things—men and women that are old and hideous, and fearfully strong and malignant—you couldn't move too quickly to blot them off the earth," I cried.

"I have seen," he said seriously. "I have seen the purple monsters, and they are terrible enough. But they are not the masters. They are but the servants, or perhaps I should say the machines, of a higher power. I told you that I had been exploring a bit. I have seen some strange things.

"There is another form of intelligence here, Winfield. A form of life unrelated to humanity, without any sympathy for mankind, for any share of human feelings. Perhaps it is a danger to the human race. The things would not hesitate, I suppose, to use all humanity as they have used the people of *Astran*. But that does not solve the problem. Would it be right to wipe them out? Perhaps it would be better for mankind to go under. Perhaps they are superior to us. The purposes of the creation of intelligent life might be better met by these things than by man. I have given it a great deal of thought, and I can't decide."

He fell silent and presently I said, "You say there is another form of life here. What is it like?"

"You will know soon enough. I wish I had never seen. It is not a good thing to talk about. There is no use for me to tell you."

The Chasm of the Strange Machine

He would tell me no more. Presently I left him and went down to bathe in the stream of water that flowed back of the camp. The water was sluggish and tepid, certainly not invigorating, but it was cleansing. When I got back Melvar and Naro were up. The girl had been very glad to see Austen again. She was talking with him, very vivacious, and very beautiful. When I saw her, I loved her, if possible more than ever.

As soon as we had eaten, Austen began to dismount the spectrometer and other equipment, and to pack them. "I can go no farther with the experiments here," he said. "I am going to take the outfit to a place where we can see one of the engines of the *Krimlu*, where the silver liquid is broken up. There I may be able to get the clue I need."

In an hour we were ready to depart. Austen led the way, silent and preoccupied with the details of his work. We went down a narrow trail

through the stagnating marshes, in the eldritch gloom of the weird red jungle, under the dull purple mist. For many hours we were on the way, until the purple dusk began to thicken, and a distant sighing whistle told us that night had fallen, and that the evil masters were abroad again.

Suddenly Austen called out in a guarded tone for us to halt. We all crept forward cautiously until we could see over the brink of a vast circular chasm. Sheer black walls, ringed by the red jungle, fell for a thousand feet. The round floor was a half mile across. Upon it was the most gigantic and amazing mechanical device I have ever seen. The thing was incredibly huge, and throbbing with strange energy. It made little sound, but the space about us seemed vibrant with power.

In the center of the pit was a titanic, shining green cylinder, perhaps a hundred feet in diameter and five hundred in length. A river of gleaming silver fluid ran from an opening in the rock, through a great open aqueduct, and poured into the cylinder in the middle of the upperside. At each end of the colossal cylinder rose a metal tower. At the top of each tower was a fifty-foot globe of blue crystal, slowly turning. Between and above the spheres arched a high-flung span of white fire—a great pulsing sheet of milky opalescent light—that roared and crackled like a powerful electric discharge, and lit the chasm with an unearthly radiance.

Toward the farther side of the floor was a second enormous machine, apparently unconnected with the first, resembling a vast telescope. The white metal tube was a full two hundred feet in length, mounted on massive metal supports. It did not seem to be in action. The barrel of it was pointing at the sky, like a telescope, or a cannon.

Then I saw a row of openings low down in the side of the vast green cylinder, with shafts of bright green light pouring from them. And I saw tiny human figures working feverishly about them. They had escaped my observation at first, so far away was the floor of the pit. Now I saw that they were taking great blocks of a luminous green substance from the doors in the cylinder and carrying them to the tube that was pointing at the sky.

I saw now that the bodies of the toilers were purple. There was something in their motion that reminded me of ants. I was amazed at their strength and agility, at their ceaseless, machine-like activity. They never looked about, never paused, never rested. They were like machines, or animated corpses, driven to endless toil by some strange force. I remembered the time I had splashed the white fluid on my arm, turning it purple, and the strange excitement of my nerves. At once I linked up the raids on *Astran*, the bracelet that Naro had found on the dead purple beast, and what Austen had told me of superior beings who enslaved the purple things. I knew that I looked upon the captured men and women of *Astran*, simply *man-machines* in this strange place!

Perhaps they were already dead. Certainly they moved, not by their own volition, but by a stronger mechanical power. They must have been under the absolute hypnotic control of the higher intelligences, who treated their unfortunate captives, perhaps with the argent liquid, to convert them into unearthly machines, of super-human strength.

We turned away into the night that had fallen on the red jungle while we watched. I was sick with horror. Austen's face was white and his hands were trembling. There was a stern, fierce light in his eye. Now I knew, in spite of what he had said, that were the opportunity given him, he would not hesitate to wipe out the masters of the purple slaves. He said nothing, but his hands worked spasmodically, he muttered under his breath, and his dark eyes snapped with angry determination.

In a few minutes we set about preparing the apparatus for the work of the night. The spectroscope was set up, with telescopic condensers, to collect and analyze the radiation of the arch of crackling milky flame. We took care to screen ourselves in the jungle fringe, and to expose no more of the equipment to the sight of the beings below than was necessary. Austen had his drawing board set up in a convenient place behind our shelter, and he alternately peered through the telescope at the spectrum, and turned to make intricate calculation in the light of a shaded flashlight. We sat up all night at the work.

All night long the white flame played between the spinning blue crystal spheres above the vast green cylinder, filling the air with its ghostly crackle and whisper. All night long the tireless purple human machines toiled in the pit, carrying the great green blocks, and evidently stacking them in the vast cannon-like tube at the side. Whenever Austen did not need me with the analysis, I spent the time searching that amazing scene, but not once did I catch a glimpse of anything that might have been the directing intelligence of all that marvelous activity.

Melvar had been very tired, and I had contrived a hammock for her from a great sheet of fibrous bark torn from the trunk of one of the red trees. She spent the night asleep in that, while Austen and I carried on the work, and Naro, not having scientific inclinations, contented himself with a couch composed of a few feathery branches torn from the undergrowth.

CHAPTER XI

What the Analysis Showed

JUST before daylight Austen completed his calculations, and stated the result. He was very tired, and his eyes were red. He had worked for a day and two nights since we had found him. He gave his conclusion in a colorless monotone.

"You know," he said, "that there are several rare gases in the air, in addition to oxygen and nitrogen. The inert gas argon comprises nearly one per cent of the atmosphere, and there are, in addition, smaller quantities of helium, neon, xenon, and kryp-

ton, not to mention the carbon dioxide and water vapor. Those gases are monatomic and do not ordinarily enter into any compounds at all.

"You know that lightning in the air causes a union of nitrogen and oxygen, to form nitrous and nitric acids, which may later release their energy in the explosion of gun powder or nitroglycerine. In much the same way the force that forms the silver fluid utilizes the photochemical effect of sunlight to build up a complex molecule containing oxygen, nitrogen, and the inert gases of the helium group. It is very unstable, and may be disrupted with the release of a great amount of energy. I was able to detect the characteristic lines of most of the gases in the luminous spectrum of the purple gas, but not until I had analyzed the light of the opalescent flame, and made my deductions from that, was I able to derive the equations and arrive at the precise structural formula, and at the exact wave length necessary to break down the molecule."

He proceeded to launch into a detailed technical discussion of the process of analysis he had used, and of the methods of inductive reasoning by which he had arrived at his conclusion. It was rather deep for me, and I am afraid some of the salient points have already slipped my mind. But I doubt that the general reader would be interested in it anyhow.

Something more important was on my mind. "Have you found out enough?" I asked. "Can you blow up the stuff? Can you wipe out the *Krimlu*?"

"I am not sure," he said, "but I think, if I could get at that machine with a little of my equipment I could manipulate it to make it go off like a thousand tons of dynamite. The silver stuff runs into the cylinder and is converted into pure vibrant energy. If I could just speed up the process a bit!

"The *Krimlu* seem to live underground like ants. A month ago I found an opening into their world near the cliffs, south of the fall. There are the shafts where their ships come out, ventilator tubes, and funnels for the purple smoke from their engines. I will go down one of the shafts and see what can be done."

"You mean we will go," I told him. "You don't think—"

"There is no need for you to risk your life," he said in a voice purposely brusque to hide his emotion. "I can do as much by myself. Then there is Melvar. We must get her out of here if we can. I think a great deal of her. If we both should go—and not come back—. No, I want you to stay on top. I know I can trust you to treat her fairly. If I can blast down the earth on their underground world, we might be able to make it back around the Silver Sea, and eventually to the outside."

"You can trust me, sir, to care for her to the best of my ability," I told him, looking at the sandal on my right foot, and trying, without notable success, to keep my voice even and casual.

"Really," he cried, looking at me intensely, "do you love her?"

A Declaration

I ADMITTED that I did, even using, as I remember the occasion, rather an enthusiastic, if hackneyed phrase to describe my feeling.

"I had hoped so," Austen said. "She and you are the dearest ones to me in the world. If you were out and safe, I could—go—in peace."

The rude hammock in which Melvar had been lying sprang into violent motion and erupted her slender, beautiful figure. She came running toward me. "I am sorry," she gasped. "No, I mean I am glad. I was awake, Winfield. I heard you—" Her farther statements were not particularly coherent, since she was kissing me, and I was holding her in my arms and returning the gesture. I gathered on the whole that my feelings for her were well reciprocated. Some minutes later, when I came back to earth, I observed that Austen was taking the equipment down, and that Naro was standing and looking at us with an expression of extreme and comical disgust on his frank and boyish face.

By that time it was light, and soon, by the brightening of the purple haze above, we knew that the sun was rising. I saw that Austen was looking into the pit. Melvar and I walked to the edge. The great metal tube, which the purple beings had been all night in loading with the green bars, was being swung slowly about upon its mounting, until presently it was pointing at the sky above the Silver Sea.

For a moment nothing happened; then a low, deep, humming drone reached our ears, coming apparently from the complex machinery at the base of the tube. Steadily the sound rose in pitch, until it was an intolerably high and painful scream. Suddenly, when the high rhythm of it had become unsupportable, we ceased to hear it; but I knew that it had merely passed up the scale beyond the range of our ears, and was sounding still.

Abruptly the colossal tube seemed to flash into green incandescence and a broad beam of yellow light, blindingly brilliant, and pulsing with strange energy, poured up into the dusky purple sky. Then I knew that it was this machine that made the amazing thing above the Silver Sea, from which the white liquid fell.

As we watched, bright patches of red and green shot up the beam. Slowly the bright yellow faded from the ray, but still the green luminosity clung about the tube, and still I felt that the flood of radiant, purposeful energy was flowing up into the sky. It was not long before I heard, far above us, in the distant west beyond the red-clad hill, the splash of the first great drop of silver into the argent lake. Below us the white torrent was still pouring into the vast green cylinder, the white fire was still arching between the crystal globes, and the purple slaves were still rushing about the pit with feverish and machine-like energy.

We turned away from the place and walked back into the terrible and weird semi-darkness of the scarlet jungle, still beneath the shadow of the

evil intelligence that ruled the crater. I had the knowledge of Melvar's love, and the bright charm of her nearness, but I felt the unholy power of the jungle already closing about to crush us.

We reached the camp long before night, and Austen and I went to sleep. The old scientist was up again at daylight. I was amazed at his energy and vitality. He got ready the equipment he intended to take, as we were soon ready to set out for the entrance of the underworld. Austen insisted that we leave Melvar and Naro behind. There was no use, he said, to expose them to the hardships and dangers of the journey, and it seemed that no harm would be likely to come to them at the cabin. Then, without them, we could travel faster and with less danger of detection. I did not like to leave Melvar, but she was very courageous about it, smiling through her tears. It always takes more courage in those who stay behind and wait than for those who have the lure of mystery and adventure to beckon them on.

Melvar walked with me to the edge of the clearing, and there we left her, taking a dim trail that led through the dense jungle to the south. Austen was saying nothing. He was lost in meditation. But I knew that when the time came for action, he would lose no time in thought. But how could I guess the noble thoughts that were passing in his mind? How could I realize that he was marching willingly to his doom? For my part, I was thinking of the wonderful girl I had left at the cabin. I thought, too, of the horror of the lights that haunted *Asiran*, and of the horror that would be if the lights ever went beyond the rim—into the outer world.

After several hours Austen stopped. "It is not a half mile to the shafts," he said. "We shall have to make a rope. I have made cords from the tough bark of the red trees. That does very well. I want to reach the bottom of the pit before night. But I have reason to think that the things are active in their underworld at all hours of the day, emerging only at night because the magnetic vibration of sunlight interferes with the operation of the delicate machinery of their bodies." Of that, I came to a better understanding later.

We began to weave a rope of strips of leather-like bark torn from the mighty red trees. We kept at it until we had many hundred feet of the tough strands. As we worked Austen began to talk a little, in a voice that was very low, and a little husky, of his boyhood on a Western farm, and of the bright spots of his life. He told a few stories of his school and college days, and of the girl he had loved and lost. But when the rope was finished and coiled, he fell silent again, and grimly examined his automatic. He adjusted his pack, got out his pipe and filled it with my tobacco, and grinned. Then he said soberly, "We are here. We are ready to play our hand, to win or to lose. And if we lose—"

He thrust out his hand. I shook it and we walked on silently. We had now gone more than a hundred yards when the scarlet forest thinned, and we walked out on a level stretch of bare white sand. The clear space was perhaps a mile long and half as wide. Along the western side rose a dark precipitous cliff, like that over which the silver fall plunged, with a line of red brush along the top. At the foot was a great sloping bank of talus, scattered with gigantic boulders. The cliff and the lofty crimson forest that rimmed the open space on the other three sides, seemed to reach into the dusky purple of obscurity of the low-hanging sky.

Spaced irregularly about the center of the flat were perhaps a dozen low circular metal structures —evidently the mouths of great white metal tubes projecting from the earth. From five of them dense clouds of purple vapor were pouring.

The Sacrifice

WE left the shelter of the jungle and quickly approached the nearest of the wells. The metal curbing was about four feet high, around a circular pit some 20 feet in diameter. We leaned over and looked into it. The tube was lit faintly for a few feet down the walls, but we saw no light toward the bottom of the tube. A faint humming sound came up out of the darkness, and I felt a strong current of air flowing down the tube. It was altogether stranger and more terrible than I had anticipated. I doubt that I could have found the courage to descend.

"Is the rope long enough?" I whispered.

"Yes," he replied in a cautious undertone. "On the day I discovered the place I dropped a pebble in the well and timed its fall with my watch. The depth is just over five hundred feet."

I put the end of the cord over the metal rim and paid it out until only enough was left to hitch around my body. With a smile of forced cheerfulness, Austen looked to his pack, knocked out the pipe, and put it in his pocket.

"Winfield, my boy, I hope to see you soon again," he said. "It may take only an hour or two to lay my mine and return to the shaft. But of course I know nothing of what I am to encounter. You wait and hold the rope, and if I need to send you any message I will jerk it three times, and you can pull it up. The note will tell when to put it down again for me to climb out. Good-by, my boy. You—"

He started to say something more, but his voice broke, and he turned abruptly to the well. I braced myself against the curbing, and he climbed over and started down. I looked over and watched him. In a few moments his head and shoulders had shrunk to a little blot against the darkness of the well. Soon he was out of my sight, although for a long time I felt the tugging of the rope. Suddenly the tension relaxed. He had reached the bottom, or —fearful thought!—he had lost his grip on the rope and was hurtling downward through the darkness. I listened in an agony of suspense. It was several minutes before I was reassured to feel three

twitches of the cord. I pulled it up. On the end was tied a piece of paper, with these words penciled upon it:

"Dear Winfield, I hate to leave us thus, without telling you, as I intend to do. But I could not tell you. Go back, get Melvar, and travel as far as you can from this accursed place. May you and she survive and lead a happy life together, in here if you cannot reach the world beyond.

"I will give you twenty hours. In that time you can go far north of the silver fall. I am sure, with the equipment I have with me, I can explode one of the engines and send all this part of the valley skyward—if I live to carry out my plan. Good-by,

Austen."

Then I saw that he had been planning all along to give up his life. The note had been written some time before he left. I cursed the stupidity that had kept me from perceiving his intention. If I had but thought, I would have known it was impossible for the aged scientist to climb the rope from the bottom of the pit. Dear old Austen! The truest friend I ever had! His wrinkled, smiling face, his kind blue eyes, his low familiar voice, are gone forever!

CHAPTER XII

The Forest Aflame

I HAVE a very confused recollection of what happened immediately afterward. My own actions seem a vague, disordered dream. My bitter grief at Austen's self-sacrifice was the only thing real to me. I believe I began carrying rocks from the boulder-strewn slope at the foot of the cliff, with the idea of securing the rope to them so I could go down in search for him. But my memory of that is very faint.

The first thing I remember clearly is that I was staggering back to the shaft with a heavy rock in my arms, when I caught a whiff of acrid smoke and awoke to the realization that the purple sky was darkened with drifting clouds, and the air was already heavy with the suffocating pungent odor of the burning red vegetation. My instinctive alarm at the thought of fire served to bring me to myself, and I was suddenly fearful for the safety of Melvar.

I knew that, had the red-hot rocket-ship in which we had crossed the Silver Sea chanced to fall in the jungle instead of on the barren hilltop, a conflagration would have spread from it at once. Abruptly I remembered that the glowing fragments of the one we had wrecked had fallen in the northern forest. Austen's cabin lay in that direction! I knew that the red vegetation was peculiarly inflammable, and that the fire fed on the oxygen of the heavy atmosphere, would advance with terrible speed.

For a moment, in a panic of indecision, I listened. From the north I heard the crackling roar of a mighty conflagration. Then my mind was made up. Any attempt to find Austen and induce him to give up his plan of self-sacrifice would be terribly uncertain. Melvar was in immediate danger, and I knew that Austen valued her life above his own. But even then, I knew in my heart that it was too late, though I would not let myself believe it. Fire is a pitiless and remorseless enemy.

At a dead run I started up the trail by which we had entered the clearing. Ever the smoke became thicker and more acrid, while the crackling roar of the fire rang ever louder in my ears. I ran on through the ghastly gloom of the scarlet jungle, in made desperation, even after hope was gone, until the hot suffocating breath of the flames was choking me, until the bright lurid curtain of the fire was spread before my eyes, and the intense heat radiation blistered my skin. The vast wall of flame swept forward like a voracious demoniac thing of crimson, implacable, irresistible, overwhelming. It plunged forward like a rushing tidal wave of red. *Already the fire had passed the site of the cabin!*

I was suddenly hopeless, and despairing, and very tired. The flames rushed forward faster, by far, than a human being could force a way through the jungle. With the knowledge that I had just lost the only two beings that in all the world of men ever mattered to me, it hardly seemed worth while to try to save my own life. For a moment I stood there, about to cast myself into the flames. But it is not the nature of an animal to die willingly, no matter how slight the promise of life may be.

When I could endure the heat no longer, when the pain of my blistered skin, and the outcries of my tortured lungs had grown unsupportable, I turned and ran toward the clearing again. Behind me, the flames roared like a lightning express. The fern-like fronds burned explosively, like gun-cotton. My nostrils and lungs were seared and smarting. The hot wind dried my skin and left it scorched and cracked. I was blinded by the smoke. I longed to throw myself down and seek the temporary ecstasy of a breath of clear air from near the ground, of a cooling plunge into a muddy pool. The red jungle reeled about me, but I fought my way on, like a man in a dream.

At last I staggered into the open space. The last of the giant trees exploded into flames not a score of yards behind me. Sparks rained upon me. My clothing caught fire. I ran on, fighting at it with my hands. The jungle back of me roared deafeningly, an angry, surging sea of lurid red flames, awful, overwhelming, fantastically terrible. Heat radiation poured across the clearing in a pitiless beam. I struggled on across the white sand, away from flames that tossed themselves up like volcano-ridden ranges of scarlet alps, until I reached the shelter of a great boulder on the slope below the cliff.

I flung myself down behind the rock, gulping down the cool air and rubbing out the fire in my clothing with my blackened hands. For many hours I lay there, tortured by thirst and pain. At last I fell into a light sleep of troubled dreams, in

which huge, winged, green ants flew after me through burning crimson forests and in which I saw the dear form of Melvar devoured again and again by the flames.

I was awakened, after a time, I know not how long, by a cool wind that had sprung up from the north. For a moment my mind was lost in blank wonder, and then came the desolate memory that Melvar and Austen were lost. In hopeless misery I got weakly to my feet and walked unsteadily around the boulder until I could look across the clearing.

As I leaned against the rock, gazing eastward, it was a strangely altered and desolate scene that lay before my eyes. The red forest was gone. Below me was a region of low rolling hills, black and grim beneath the lowering, smoky purple sky. The white sand about me stood out in sharp contrast to the charred and gloomy waste beyond, from which a few slender wisps of dark smoke were still rising. All life was gone. It was a dead world. But still the dense purple clouds poured out of the shafts of the underworld, adding their weight to the dismal sky.

A great homesickness for the world, and my fellow men came over me. Then I heard a strange humming behind me, and a slight metallic clatter. I turned around in apathetic curiosity.

A Strange Duel

AND I came face to face with a monster so utterly strange and weirdly terrible that the very shock of it almost unseated my wandering reason. But so completely had my interests and hopes in life been severed, so near was I to the great divide of death, that I was past emotion of any kind. At first I looked on the thing with a curious lack of interest, as the soul of one newly dead might look with numbed faculties on his new habitation. But as I looked upon it, an icy current of fear stole over me like the creeping cold of the north, and clasped me to its frozen breast. I had met so many horrors that I had begun to think myself immune to terror. But I had met no such thing as that.

I knew that it was an intelligent, a sentient being. But it was not human, not a thing of flesh and blood at all. It was a machine! Or, rather, it was in a machine, for I felt far more of it than I saw—a will, a cold and alien intellect, a being, malefic, inhuman, inscrutable. It was a thing that belonged, not in the present earth, but in the tomb of the unthinkable past, or beyond the wastes of interstellar space, amid the inconceivably horrors of unknown spheres.

There was a bright, gleaming globe, three feet in diameter, lit with vivid flowing fires of violet and green. A strange swirling mist of brilliant points of many colored lights danced madly about it—a coruscating fog of iridescent fire—moving, flickering, in an incredible rhythm.

That unearthly thing rested upon a frame of metal. It was the head of a metallic monster. It was set on an oblong box of white metal, to which were attached six long-jointed metal limbs. The being stood nine feet high, at least. It was standing on three of the limbs and holding my rifle, which I had left where I had been lying, turning it and feeling of it with a cluster of slender, finger-like tentacles on the end of the metal arm. It was working the mechanism of the gun, and apparently looking at it, though it had no eyes that I could see.

Suddenly the gun went off, throwing up the sand between me and the monster. With a grotesquely half-human attitude of alarmed surprise, the being dropped the gun and sprang back like a gigantic spider. The motion freed me from my paralysis of horror, and I started backing cautiously around the boulder, afraid to run. As I moved it sprang forward and a slender tube of white metal, in one of the tentacled hands, was suddenly pointed toward me. As the monster moved, there was a humming sound from it, and little jets of purple gas hissed from holes in the sides of the box-like body.

I drew my automatic and fired at the metal tube. I must have made an unusually fortunate shot, for the object was carried out of the metal grasp, and fell spinning on the sand. On the instant, I turned and ran toward another great boulder, as large as a railroad locomotive, that lay fifty yards to the north. As I ran I heard the clatter and whirring of the mechanical being. I paused at the edge of the rock and took a last glimpse back.

The monster was holding the little tube in one of its limbs, and apparently adjusting it with another. Then it suddenly extended the thing toward me. I dived behind the rock. And a bright ray of orange light shot past the boulder—a beam like that which had come from the being in the door of the rocket ship. Then I knew that here was an entity of the same kind as the one I had destroyed that night—one of the ruling intelligences of the crater, the *Krimlu*.

For several minutes I crouched behind the boulder, expecting the terrible being to come striding around after me at any instant; but it did not come, so presently I began to think. Perhaps the things were not so powerful, or so extremely intelligent after all. I had killed one, even if it was just by a chance shot in the dark. This one had seemed surprised and alarmed when the rifle went off, and I supposed that a being so intelligent as I had at first thought it to be might have inferred the nature and use of the weapon from its appearance. And I thought that it must be afraid of me, after my pistol bullet had knocked its own weapon out of its grip, or it would have followed me around the boulder. Then I began to wonder what it was going to do.

It evidently intended to strike me with the ray weapon. And not only did it respect me, but it knew that I stood in deathly fear of it. It knew

that I was trying to escape, so it might reasonably expect me to leave the unscalable cliff and attempt a break against the open country. And if I were to do that, I would naturally keep in the shelter of my own boulder as long as possible. If the monster thought in that way, the logical thing for it to do would be to creep out of the upper side of its rock, where I would inevitably come into its sight by whatever direction I left my breastwork.

Of course there was a frightful risk in taking any action on such a hypothesis—a greater risk than I realized at the time. If the monster were less intelligent than I supposed, I might blunder on it; if it were more intelligent, it might have anticipated my plan—might be waiting to trap me.

But I crawled out along the upper side of my boulder and peered over a smaller rock which would serve me as a breastwork, my automatic ready. I expected to see the creature in my range, and itself intent upon my other lines of retreat. But it was not there. For a moment I thought I was doomed, but the orange ray did not strike, and I was forced to the conclusion that the monster was not in a position for action at all.

For a moment I was tempted to precipitate flight across the clearing, but I knew that such a move would put me at the mercy of the ray, and I thought that it might not yet be too late to carry out my original plan. I lay flat, with the gun trained on the spot where I expected it to appear. For perhaps fifteen minutes nothing happened; then it proved that my hypothesis was justified. The weird being suddenly sprang into view, with the strange weapon grasped in its glittering arm. It seemed to be looking beyond my boulder. I was lying ready, with the automatic leveled. It was a matter of the merest instant to aim at the green sphere and pull the trigger.

The globe was shattered as if it had been made of glass. The glittering fragments showered off the metal box, while the whole mechanical body suddenly became very rigid, and fell heavily to the side. A puff of coruscating green mist floated out of the globe as it broke, and swiftly dissipated, and the sparkling lights were about the thing no more. The monster was evidently dead.

For a few moments I hesitated, but I was sure the thing had been killed, and my curiosity got the better of my fear. I cautiously approached it. For a moment I marveled at the wonderful workmanship of the machine and at the cleverness of its design; then I saw something that made me forget all else. Something beside the crystal shell had fallen.

The tissue of it was very delicate, and it had been broken by the fall, so that the body juices were running from it. The brain cavity of it was very large—perhaps larger than that of a man—covered only with a thin chitinous shell. The limbs were but thin tentacles, almost altogether atrophied. In fact, the brain seemed three-fourths of the total bulk. The body was so badly smashed that I could tell little about it, but the tiny limbs were covered with chitin, and there were the rudimentary stumps of fine, tissue-like wings. There were no visible traces of digestive organs, or of mandibles.

The thing was plainly an insect. From just what species it had sprung in the long process of evolution in the crater it would be difficult to say. For several reasons, I believe it was an ant. At any rate, it had reached about the ultimate stage of evolution. Machines had altogether replaced bodies of flesh and blood. I believe the thing had been nourished by the sparkling green vapor, which must have circulated like blood through the protecting crystal sphere.

It seems incredible to find great intelligence in any form of life other than human; but science thinks that life and intelligence must rise and fall in recurring cycles, and that the earth has probably been ruled by many different forms of life, each of which has been blotted out by some cataclysm. The *Krimla* were a surviving remnant of archaic ages.

CHAPTER XII

When Austen Struck

I LOST little time in the examination of the dead creature. The shafts from which it had come were but a few hundred yards below, and the purple gas was still rolling out of the funnels. I did not know when a second monster might follow the first. My mind was too much upset by grief and terror to be capable of intelligent planning, but I knew I wanted to get away from here, and I think I had some notion of reaching the northern pass, and of getting back to an unburned growth of the red vegetation, for I was weak with thirst and hunger. But all that was very vague.

I walked around the wells, keeping at a distance; and struck out for the east as fast as my wearied limbs could carry me. Soon the cliff was out of sight. All about was the desolate, rolling black landscape, with the gloomy purple sky overhead. My thoughts were as dark and sere as the world. Memories of dear old Austen and of lovely Melvar were always with me, even when I tried to banish the and to think rationally of my position.

When I had gone perhaps three hours from the cliff, and had almost lost my fear of pursuit, I saw a great cigar-shaped object of gleaming white on a low hill before me. So dulled were my perceptions that it was many minutes before I realized that it was the rocket-ship in which we had come over the Silver Sea. Then, bringing a faint thrill of hope, the thought came to me that it was still probably in a condition to fly, and that, if I could succeed in controlling it, it offered a possible avenue of escape from the crater.

I walked up to the thick metal walls. They seemed undamaged by the fire. Of course, they were used to withstanding the far higher temperatures developed during flight. I walked around the ship, and was surprised to see that the heavy metal

door, which we had left open, had been swung shut. Lying against it was the charred skeleton of a man. About the bones were woven metal garments and crystal armor that I recognized with a shock as Naro's. So, I thought, the fellow had deserted his beautiful sister to seek the shelter of the rocket-ship, and had fallen a victim to the flames at the last moment.

For a moment, I stared grimly at the remains; then, animated by a sudden ray of hope, I sprang to the door, pulled it open, and leaped into the ship. There, lying on the floor, was the lovely form of Melvar. Her clothing was tattered and smeared with stains of red and black from the burning forest, but she was unharmed. It was almost incredible to me to find her restored. I was half afraid that my mind had failed at last, and that she was but an illusion. I dropped on my knees beside her, and kissed her warm red lips. She stirred a little and, still but half awake, put a trustful arm about my shoulder.

"Winfield, I knew you would come," she whispered at last. "But where are Náro and Austen?"

"They will never come," I said.

She drew me fiercely toward her, as if to use me for a shield against the awful truth. It was some time before she was able to talk; but presently she told me how Naro had seen the smoke, and how she had thought of seeking shelter from the fire in the rocket ship. They had run down the trail we had made as they left the ship. The fire had overtaken them just as they reached it. The boy had carried her the last few yards, had put her through the door, and then had been unable to enter himself. But, a hero to the last, a worthy warrior of old *Astran*, he had swung the door shut with his dying motion.

Presently I turned my attention to the ship. The marvelous periscope still gave the illusion that the bow was transparent. When I moved the little control lever, the jets of purple gas rushed out again. After a time I had the vessel worked loose from its place in the earth. Then, once again, I pulled up the little metal knob and pushed it forward.

The blackened terrain was colored by the purple mist. It was dimmed, blurred, blotted out. We shot through the purple cloud and abruptly plunged into clear air and blessed sunshine. Melvar stood by me, with her arm upon my shoulder. She cried out gladly as we came into the light. It was not quite noon and the sun was shining very brightly into the crater. The crescent Silver Lake was still gleaming with the same argent luster, and *Astran* shone like a great gem set in the dark red upland beyond.

Suddenly the clouds of purple mist below were thrown up and scattered in a thousand ragged streamers. A great blaze of opalescence burst out where it had been. A flood of fire ran over the Silver Sea. It was a white, milky light like that we had seen between the blue crystal globes of the great machine in the chasm. In a moment the whole crater was a torn and angry ocean of iridescent flame. The red upland was blotted out, and *Astran* vanished forever. White flames that were like the tongues of burning hydrogen that burst from exploding suns, flared up behind us.

Then we heard the sound of the cataclysm—a crashing roar like the thunder of a thousand falling mountains, as deep, as vast, as awful, as the crash of colliding worlds. At the same instant we felt the force of the greatest explosion that has ever occurred on earth. The rocket shot upward as though shot out of a mighty cannon. The blue sky darkened about us, and the stars flamed out like a million scintillating gems, in incredible myriads, gleaming cold and hard against the infinite empty blackness. We had been hurled out of the atmosphere and into interplanetary space!

Austen had struck! The world of the *Krimla* was no more! The whole Silver Sea had gone off in a great explosion. From our ever-rising craft we could see the desert spread out around the mountain like a vast yellow sea, rimmed on the south by a steely blue line that was the ocean. The white fire dulled, faded, and was gone as quickly as it had flashed up. The crater of the Mountain of the Moon was left a wild black ruin of jagged, scattered masses of smoking stone. Of the Silver Lake, of the red vegetation upon the upland, of brilliant *Astran*, not a trace was left!

The crater was left far behind in the long arching flight of the rocket. The white frozen brilliance of the stars faded out, the untold glories of the solar corona were dimmed, and blue was restored to the midnight sky. We were plunging toward the desert in the direction of Kanowna. I pulled back the lever and used the full force of the rockets to check our meteor-like flight until the fuel was exhausted. A moment afterward we struck the earth.

We climbed out and left the vessel there on the sand. Just as the stars were coming out that night we arrived at the headquarters of a great sheep ranch. People were very much excited over the earthquake. (The shock of the explosion of the Silver Lake had been registered at every seismographic station in the world.)

The rancher and his wife cared for us with great hospitality, if ill-controlled curiosity. After we had had a week of rest, they took us by automobile to Kanowna. There I astounded them by rewarding their generosity with a magnificent emerald—I still had in my pack a half pound or so of jewels that Naro had brought me from *Astran*.

Melvar ever surprised me with her innocent beauty, her grace and poise, with the ease with which she learned to face new situations, and to meet people. I believe that no one ever suspected that she had not had a lifetime of training in the best of society. We were married at Kanowna, and reached Perth a few days later.

THE END

The Feminine Metamorphosis

by DAVID H. KELLER M.D.

She was called a biological chemist and would take the glands from the operations into her laboratory and work on them. When she finished she had a test-tube of clear liquid called "ampules."

CHAPTER I

A Woman Protests

"I CANNOT understand why I was not promoted!" protested the speaker. "I am more competent than the man you appointed to that position, and you ought to know that I have been in full charge of the department during the illness of the late occupant."

"You were not promoted because you were a woman," replied the man on the opposite side of the table. "I am willing to admit that you are capable and also that you have been filling the position for over a year. But there are certain places in this company that have always been filled by men and always will be filled by men. It is the policy of the company. We feel that we cannot compete with our opponents in business unless these places of trust are filled by men. So, you will have to be satisfied with an increase in salary, and your usual place in the office."

The protesting woman flushed angrily as she cried:

"It is not fair to discriminate against me because I am a woman!"

"The question of fairness does not enter into it. We are in business to make money. I have been elected by the Directors as the President of this company. We expect to make a profit. The Directors believe that certain offices have to be filled by men. You have gone up in this company rather quickly, but you have reached the limit. If you want to stay, we shall be glad to have you, but you will have to be content with your present position."

There was no doubt about the fact that both the president of the company and the most brilliant woman who had ever worked for it were thoroughly mad. They were so mad that the interview came to an abrupt ending by the woman's leaving the room.

A few minutes later, when the man realized the necessity of keeping her, he wrote her a nice letter to the effect that from that time on her salary would be $15,000 a year instead of $12,000, and he sent it to her by special messenger. He thought that the increase would end all the hard feelings.

The next day Miss Martha Belzer seemed to be in her usual good humor. She was as capable as ever, in fact, the letters and reports that she dictated fairly sparkled with intelligent and shrewd conclusions. John Buchanon, the President of Aviation Consolidated, reading over some of her reports, perceived their value, and smilingly told himself that a few thousand extra was worth more to a woman than her pride, and at once forgot the incident.

DAVID H. KELLER, M.D.

That afternoon, after office hours, Martha Belzer took her portable Corona into her private office and locked the door. Several times during the night she sent the watchman out to get her a bite to eat. When she finally emerged it was one in the morning. During those long hours she had written nine letters to nine of her intimate friends—business women all over the United States—and these letters she personally mailed from a sub-station, sending them registered, receipt required.

The next morning she was at her desk as usual, opening and answering the mail and tending to the thousand and one details of the department, many of which should have been looked after by the new head of that department. However, he had been in a poker game that night with other heads of departments; so he was not able to begin work till after his luncheon. When he did arrive at the office, he made a great pretense of business and efficient direction, but as all the work had been done by that time, he soon relaxed, and made arrangements for a golf game. Life, at $30,000 a year, looked rather pleasant to him. He had worked hard to secure the position, that he now held, and, with such a capable assistant as Miss Belzer, he did not see any reason for killing himself with too great attention to little details that she could attend to just as well as he. The fact that she had taught him all that he knew about the business of that department and that the business of the company would suffer without her services, irritated him, but he felt that he could forget such unpleasant matters.

The humiliation of Martha Belzer was not

WHEN a physician-author writes a story on a biological subject, you may be sure that it will be more than interesting. Only during recent years, have the functions of the various glands in the human body assumed a tremendous importance. It seems that the glands are responsible for almost everything imaginable in our mental and physical make-up. It is also true, very frequently, that these functions can be interfered with by altering or otherwise influencing the glands.

It has been known for some time, that extracts from various glands can be used as a stimulant to the live glands of human beings, although the extract has been secured from animals or human beings.

It may be safely said that the wonderful field of gland surgery and medicine is as yet practically untouched. Some of the most surprising and far-reaching discoveries will come when we know more about them.

In the present story, Dr. Keller, with his usual insight, has written a most original story that is as good as it is amazing. And incidentally, he has given us a most clever O. Henry ending—a climax as surprising as it is unique.

an isolated one, by any means. Similar occurrences were happening every day in the large concerns of the United States. During the World War the feminine sex had tasted the sweetness of responsibility with increasing incomes, so that at the close of the war they were reluctant to return to their former humble positions. Well educated, capable, and hard working women were striving to occupy positions on a par with men, and the situation had become so acute that many corporations had passed regulations, strictly limiting the advancement of women in their employ. The stand that Aviation Consolidated had taken was by no means unique in the industrial life of the nation.

The result had not been a happy one. More and more women were preparing themselves for positions of trust and large salaries. Every phase of business activity, especially those requiring brain power, was being handled by the members of the fair sex, who, by their constant application to work, their ability to look after the smallest details, and their one-track minds, were far more capable of holding positions of trust than was the average business man.

There were women in the House of Representatives. It was rumored that a western state was preparing to place a female Senator in Washington. Several states had elected women as Governors. The legal and medical profession were gradually surrendering to the demand of the feminine portion of society for a chance to compete on equal terms. Entire banks were officered by women. Only in the priesthood had men dared to entirely exclude the opposite sex.

More and more women were refusing to stay in the home. It was a common thing for a well-paid woman to have bachelor apartments down town where her comfort was well cared for by capable servants.

A Rich Man Dies

WOMEN in positions of responsibility easily made from twenty-five to fifty thousand dollars a year. A large number were in business for themselves. Naturally, they could not handicap themselves with husbands or cripple their earning capacity by child-bearing. They had their social life. Some married, but retained their maiden names, lived on in their own apartments and breakfasted or dined with their husbands three times a week.

But, up to the present time, they had only been able to nibble at the crusts of finance. No woman had been elected to the Presidency of a large concern. Not a single one was drawing the large salaries, as high as several million a year, paid to the big men of industrial America. While the brainy women knew that they were as capable as men of doing the great things of life, the men, so far, had been very careful to see that they did not have a chance to show this ability.

And, so far, there had never been a really rich self-made woman in the United States. The few wealthy ones had inherited their property and were content to leave the directing of it to their husbands. A few women, mainly those who owned their own business, reached the millionaire class, but the great wealth of the nation still rested in the control of the male sex. And there seemed to be no way that it could be taken from them.

The fact of the matter was that the men of the United States who owned the greatest part of the wealth of the nation were afraid. They did not fear the election of a Democratic president, or a change in the tariff, or even a lowering of the immigration bars. What they were afraid of was the possibility of feminine control of the great corporations of the nation. And they were endeavoring to prevent this in the most logical manner that occurred to them. They believed that the best thing was not to allow the women to start securing that power. Unless they did start, they would never succeed. So, the word passed from the President of one great concern to the chief executive of the next that under no circumstances should a woman be promoted to certain positions in these companies, and it was the following of this rule that had prevented Miss Martha Belzer from securing the promotion which she and everyone else knew that she was entitled to.

Miss Belzer nourished her indignation.

But she was not the only woman who was resentful.

In the hearts of the business women of America seethed revolt.

It was an interesting coincidence that in the week following the date of Martha Belzer's great disappointment, Patrick Powers, the richest man in America, died. He was not responsible for this occurrence, or for the fact that his only child was a daughter. He had lived as long as he could and had tried his best to change the destinies of his family. But, eventually, the end came, and at his bedside was neither kith nor kin save the fifty year old daughter, who was single and, to say the least, peculiar.

For some years the rich man had been growing more and more obstinate. It had finally become an impossibility to do business with him. Efforts to influence him, to aid him in arriving at decisions only served to make him more hard-headed and more stubborn than ever before. As he grew older he kept his own council and thanked others to do the same. The truth of the matter was that he was basically a miser and in his old age developed paranoiac ideas that others were trying to rob him of his hard-earned wealth. Consequently, he resisted all efforts made to influence him in drawing up a will and left every cent of his enormous estate to his daughter.

For some weeks she gave no indication as to what disposition she intended to make of this prop-

erty. Finally, it was learned by several magnates that the only thing that she was really acquainted with was cash and Government bonds and that she intended to sell all of the stocks, bonds and interests that her father had owned and that she was going to sell them to the highest bidder for cash.

Patrick Powers had held the controlling interests in a dozen of the largest corporations in America. The purchaser of these stocks would acquire this power. Half a dozen interests had been waiting for just this opportunity and were more than willing to bid against each other.

As a commercial event, it was not nearly as spectacular as it might have been. Miss Patricia Powers held it in her home. She invited a dozen financiers to attend. The certificates, stocks and bonds were actually there, in great brass bound boxes, neatly arranged on the parlor floor, and securely guarded by a silent group of well-armed private detectives. The stock was put up, block after block, and auctioned off. When a sale was made, the fortunate man was asked to come up to the central table and deposit a certified check. He carried the package of stock back with him for deposit in his own brass bound box, to be guarded there by his own private detectives.

The sale lasted several days. The prices secured were high. In some instances the shares sold for well over the value Powers had set. The auction was conducted in a quiet, dignified manner, but when it was over, Miss Patricia Powers was the owner of over three billion dollars worth of certified checks, good for gold when presented to the proper banks.

There was one interesting feature about this sale. No one commented on it, even if he did happen to notice it. The auctioneer, the clerks, the book-keepers who conducted this sale were all women.

After it was over, Miss Powers went into conference —with women.

CHAPTER II

Taine Gets A Commission

TAINE, of the Secret Service, was spending a few days at home. He had just returned to San Francisco from a rather trying trip to New York, where he had rendered great service to that city. Always shy, he had refused to set any specific value on this service, but the check given him was enough to keep him comfortable for the rest of his life. As soon as he could do so, he had given ten percent to his wife, who was in the habit of giving this extra cash to the Woman's Missionary Society of her church. However, the ten percent in this instance was so large that she held back a part of it to buy a year's supply of clothes for herself and her two daughters. She also bought a scarf pin for her husband. She was rather proud of his appearance, and his refusal to buy himself an appropriate scarf pin was a source of much sorrow to her. The one that she selected, a large question mark of platinum, with an equally large diamond at the bottom, seemed singularly appropriate, as she remarked to the pastor's wife, who had accompanied her on this special shopping trip.

"My husband makes a very fine living, solving unusual questions for other people who are too stupid to solve those questions for themselves. So, this question mark will not only represent his profession, but will also serve as an advertisement. You know, Dearie, that he draws a regular salary from the government, but this is so small that we should really suffer were it not for his extras. So I think that I could not do better than to buy this special pin for him."

"But do you think he will wear it? Has he ties that will go with it?"

"Certainly, he will wear it. That reminds me. I must buy some new ties for him. He thinks my selections in such things remarkable. Don't you think red ties with a black polka dot would go well with this pin?"

So, that evening Mrs. Taine presented the pin and the six new ties, and her husband kissed her and thanked her and put every one of the new ties in a special drawer and the pin with the rest of his jewelry. He was really a very remarkable man. The next morning his daughters observed that he wore the black bow tie as usual, and commented on it, but he simply said that he was going down to the city headquarters and he did not want the Chief to think that he had grafted too much in New York. His wife was busy cooking waffles on the new electric waffle iron, that had a red signal to tell when to put the batter in and a blue signal to indicate when the waffle was done, so she did not notice what kind of a tie he had on. So, blithely calling his little black puppy to follow him, Taine walked slowly down to Headquarters.

The day before, the Chief had told him to take a week's vacation. Taine had replied that he would do this with pleasure, as the *Arbor Vitae* hedge around his house needed trimming badly. Yet, the Chief had sent for him today by special messenger, and Taine knew by past experience what that meant. Reaching the building that housed the Secret Service of the Queen City of the West, Taine put the puppy to sleep in one of his overcoat pockets and walked in to see what all the trouble was.

The Chief welcomed him, at the same time apologizing for breaking into his vacation.

"Sorry, Taine, but the Government wants to send a man to China, and I made up my mind that you were the one to go."

"But I do not want to go." The little man was almost indignant as he said it. "The very idea of me going to China, when you said I could go off duty for a week—the very idea—and my wife just giving me a fine scarf pin with a diamond in it and six new red neckties with large black polka dots in them—the very idea! You know as well as I do that a real detective could not wear such ties—in China. She will feel disappointed if I do not wear them. China? Why, naturally, you had to send

for me to go. I am about the only man on the force that can go to the Orient as a Chinaman and get back alive—when is the next boat?"

"I thought you refused to go."

"I ought to. But, if it is something special, I guess I had better leave my vacation go for a while. I suppose there will be a special bonus of some kind—that will make my wife more kindly towards the idea of my leaving right away. You see, she gets ten percent and that goes to the Missionary Society. So, give me the details, and I will go home and pack up."

"That's the way to talk. I knew you would go. I really do not know what the work is. All I can tell you is that I received a wireless from the Department in Washington, asking me to have my best operator report at once to Washington Headquarters for instructions. The wireless specified a man who was well acquainted with China. of course, I thought of you at once, and I thought you would have no objection to going. That New York trip gave you some publicity among our profession and I am sure that you will get a promotion if you keep on."

Taine stood up and stuck his hand in his overcoat pocket.

"I can tell you what I will get if I have another trip like that New York one. I'll get killed. That is what I'll get. This here little dog I have sleeping in my pocket, he and I almost got killed in New York. I hate to go to China, Chief. You remember the last time I was there I made Ming Foo awfully mad at me. Still, my wife won't like it if I continue to ignore her presents, and—did you ever see a red tie with big, black polka dots all over it? Honest, Chief, I would rather drink tea with Ming Foo than wear that kind of a tie down-town—might look all right when I was just out clipping the hedge, in the back yard. Guess I had better go to China. Send a good man up to clean the yard and cut the hedge for me, will you? Do I get transportation to Washington from you? Suppose I have the wife send you a few of those ties? Well, the little dog is restless, so, off we go to China—if anything happens, see that the Mrs. and the girls get the pension and anything else that is due them."

So, he put the little black dog down on the floor, and the man and the dog trotted off.

Taine Goes to China

AS SOON as possible Taine reported to the Chief of the Secret Service at Washington. That official greeted the San Francisco man as a long lost friend. He remembered only too well the danger that had threatened New York and the part that Taine had played practically single handed in destroying that danger. In fact, he had urged Taine to sever his connection with the Secret Service of the western city and come to Washington. Taine had refused to do this, pleading a long residence in the city of the Golden Gate and the fact that his wife enjoyed her position as President of the Missionary Society.

"Come right in," he said to Taine, "we will shut the door and start right in to business. Have a segar?"

"No, thank you. I used to smoke, but I found that the tobacco was bad for the delicate enamel of my teeth, and once that is destroyed, it is never replaced."

The Washington Chief laughed.

"I remember hearing about that delicate enamel when you were in New York. You had a narrow escape there, Taine, but that is nothing new for you. I understand you had a good deal of service in China. You ought to go into private work. If I only had the nerve, we would go into business together, but, after a man becomes accustomed to office work, it is hard to go on the road again. Do you want to go out to China for me?"

"Not very much. There is a man over there, Ming Foo, who is not very friendly to me."

"Never heard of him. But you will go?"

"Guess I shall have to. You see, my wife gave me some neckties——"

"Let's talk about the ties later on. There is a peculiar situation over there. About two years ago some doctors went over there and started a charity hospital. For a while, there was nothing very extraordinary about it. Then things began to break loose, and at the present time, affairs are all sixes and sevens in that part of China, and no one seems to be able to tell what the trouble really is. All the doctors in this hospital are women, and the State Department, not wanting them killed, asked them to come down to the coast and bring their hospital with them, and these young fools at once refused. It is a singular fact that the Chinese Government in power in that part of China wants the hospital to stay there, and we cannot understand why. To complicate matters, a revolutionary party is trying to capture the city—and swears that it will control this hospital. Everybody seems to want the hospital to stay there, yet, they all are fighting among themselves in regard to it. Meantime, the young fools are operating day and night and seem to have all the work to do that they can handle."

Taine looked annoyed,

"I can see it all now," he sighed. "You want me to dress up like a Chink and go over there and be operated on so you can find what those girls are really up to."

"That is it exactly."

"And if I take my black dog over with me, I get operated on and he gets into the stew. You better send a real Chink over, Chief. I can give you the names of a few good ones out home. They would not mind being operated on by a white girl. Personally, I object. I have too great an imagination."

"But they would not operate on your imagination."

"I know but I just don't want to go. Every time I mix up with women I get into trouble."

The Chief paid no attention to him.

"You can get your letters of credit and other credentials fixed up today. You have unlimited funds at your control. The only thing you are not strong in is our support. Of course, we will help you all you will let us—up to a certain point—but that is a wild country—lots of bandits. If anything goes wrong, we will take care of your family. I have a lot of recommendations in this envelope. This evening we will put you on board the Mayflower and transfer you later on to one of our cruisers that we are sending to China for just one purpose—and that is to carry you. Only a few know who you are and just two of us know why you are going on that cruiser. The Captain will see that you are royally entertained. Can you arrange to leave tonight?"

Taine thought of those six red neckties with the black polka dots——he thought of Ming Foo, waiting to kill him in a very honorable way——he remembered that he always became seasick, never really liked the ocean——and, after thinking of all these thing, he sighed, as he replied,

"Guess I might as well go. Send a Chink from the department over with me so I can practice talking the language on the voyage. I used to do rather well at it, but since my teeth went bad, I may have trouble. You look after the family, Chief, if I don't come back—tell my wife that my last request was to have those neckties distributed among my friends— and you can have the diamond scarf-pin. You would like it, Chief."

Under the friendly nonsense and banter was a strange air of constraint, for both men realized that there was danger on the other side of the world, danger, and perhaps death for the little operator from San Francisco.

CHAPTER III

Taine Returns with a Tale

EXACTLY six months and three days later Taine silently re-entered the private office of the Chief of the Government Secret Service. He looked about as healthy as when he left, though, perhaps, he was underweight. During those six months and three days he had not sent a single work of a report. He had simply gone to China, disappeared, and reappeared in Washington in due course of time. The Chief was delighted to see him, for more reasons than one. He was also almost bursting with curiosity as to what had actually happened. Enthusiastically greeting Taine, he demanded an immediate report.

Before answering, Taine took a little black dog out of his pocket and put him down on the floor. The Washington man looked at the dog in astonishment,

"You don't mean to tell me that you still have that dog?"

Taine shook his head in a peculiar gesture of sorrow and amusement,

"No. This is the same breed of dog, only this is a she dog. That little dog I took to China looked just like this dog, but that dog was a he dog. I got into a place where the men were not very popular; so, I had to change dogs."

"If you were anyone else, I would say you had gone insane!"

"I know, but facts are facts. Part of the trip was dull and then parts were lively. All my life the women have kept me busy and they did not miss it this time. However, I settled with Ming Foo. He will not bother me anymore. That was one of the satisfactory parts of the trip. In fact, I helped operate on him."

The Washington Chief forced Taine down into an easy chair. He pulled an automatic out of a drawer and pointed it at Taine,

"You tell me what happened, and if you leave out anything of interest, I am going to shoot you."

"Don't shoot, Chief. You might hurt the delicate enamel of my teeth. Well, I arrived in Shanghai, and wandered around the country and finally came to the city where these girls were operating. I was disguised as a Priest for a while, and then later on I dressed up as a flower girl—I suppose you know what they are in China. Well, when I came near the hospital, I put a lot of my cash into real jewelry and hired a lot of Chinks to chase me into the compound of the hospital. It looked just like a scene from the movies. There was the poor girl running as fast as she could from the Chinamen who wanted to capture her and ruin her life in an opium den, and just in time the Marines dashed out through the opening gate and the girl just managed to get inside in time. They led me to the Captain of the Marines, and I told him my story, how I was really a rich man's daughter but run away from home because my father wanted me to marry an old man that had three wives already. Then this Marine, filled with pity, took me in to see the Chief Surgeon, and I told her the same story, only I proved it to her by showing her my jewels, and I told her that I learned to speak English in London, having had ideas of becoming a doctor, but my father brought me home before I could complete my education. Naturally, she and the other lady doctors were very sympathetic and they promised to keep me, and perhaps after a while I could work in the operating room as an orderly. That looked like a hard life, because, even though I have a very soft white beard, it meant shaving three times a day, but the only way I saw to get in there and find out what was going on was to go in as a woman. They were all females except the Marines.

"It was a peculiar situation. The Marines were guarding the hospital and the Government was guarding the hospital, and outside the city the bandits were guarding the hospital, and everybody was trying to capture the hospital so, he could run it better and protect it more efficiently. It looked

like a peculiar state of affairs, and I was there over a month before I could make anything out of it.

"We were just as busy as could be. They had five doctors there, and they just kept a regular line of patients going into that operating room. I never saw a lot of Chinamen that were so anxious to be operated on. Finally, I tumbled to it. Those girls were paying the Chinks for the operations. Every Chinaman got a hundred dollars in gold when he left the hospital, and all his hospital expenses thrown in. But just as soon as he left the hospital, the High Mogul of the city picked fifty dollars of that gold and,the Little Mogul took another twenty-five; so, all the poor devil who was operated on got out of it was a little twenty-five. But that was a fortune to most of them, and there was always a long line waiting for a chance to get in. As far as the Government was concerned and also the lesser officials, it was a sweet piece of graft, and there is no telling how many of them divided that gold. That was the reason why they wanted that hospital to stay there. And that was the reason the bandits wanted to capture the city. There was just a steady stream of gold going out of that operating room, and whoever held the city could grab a big piece of it. The Marines were there to see that nothing stopped those girls from operating; so, they did not care who was in power, so long as the supply of Chinamen held out.

"Of course, I am acquainted with women, being a married man with two daughters, to say nothing of the third one who is married and whose clothes are bought by another man—so, you might say I know a little about females. But I never in all my life saw women like those Doctors. They just did two things besides eating and sleeping. They operated on those Chinamen and talked about equal rights for women. To listen to them talk, you would think that man was just a worm and that their chief delight was to step on him. They even seemed to take a great pleasure in their operating—brag about it—the different doctors would boast as to the number of Chinks they had operated on.

Strange Happenings

"I BECAME a great favorite with them. In fact, some of those lady doctors became quite fond of me. Of course, you must not let on to my wife about that—she would not understand—but those women doctors sure did like me, and thinking all the time I was a little Chinese girl; they thought I was cute—and I let them think so—and I studied hard and, by and by, they let me sort of help with the operations.

"There was one of those girls, she was a chemist of some kind. I suppose she might be called a biological chemist. Anyway, she did not have anything to do with the operating, but she would take the glands into her laboratory and work with them. I used to go in and see her work—she liked me—I taught her to say some words in Chinese—and when she finished with her work, she would have a little clear liquid that she called ampules which she put into glass tubes. It must have been delicate work, because there were whole parts of it that she said could not be trusted to anyone else. Every week or so a special agent of the Express Company came out from Shanghai with an army of Chinese soldiers to guard him, and he would take a box of these little ampules for shipment to some place in Paris. Of course, all this cost a lot of money, but those girls seemed to have enough and to spare. Someone is putting up a world of gold on this proposition.

"I did not have any textbooks and, to be sure, the Doctors were close-mouthed about it all, and the chemist, she was even worse than the Doctors. But the way I figured it out, those girls were cutting something out of those chinks and making some kind of a medicine out of it and shipping it to Paris, and it must have been awfully valuable, judging from the cash they were getting and spending. Every operation cost a hundred, to say nothing of the cost of running the hospital and taking care of the patients till they were able to leave, and besides that, there must have been over a million spent to soothe the really big people in China—perhaps several million or more.

"Of course, they got the money from somewhere—gold in that amount does not grow on bushes—but where they got it from is not as interesting to me as what they were doing it for, and why there were only women in it. Perhaps it was some kind of beauty culture treatment—you know women in Paris and New York will pay anything to be made good-looking.

"But I do not believe it was beauty they were after. I helped, at the last of my stay there, with a few of the operations, and I do not think they were after beauty. It must be something different from that—anyway, I finally got the best of Ming Foo. I do not think he will bother me anymore. You know you gave me unlimited credit; well, I spent some of it in bribery, and the first thing Ming Foo knew he had been drugged by some of his men and brought to the hospital. He was a big, handsome brute, and the doctors thought he was one of the finest specimens they had found. They liked his heavy beard; most of the chinks did not have so very much hair on their faces; so, they did a bilateral operation on him—most of them they just operated on one side, and when Ming Foo came out of the ether and finally recovered from his dope to realize what had happened to him, he was real provoked—we had to keep him tied down for a while, and even the fact that they gave him two hundred dollars instead of one hundred did not seem to relieve his feelings. Finally, he became so raw in his actions that the Marines had to kick him out of the hospital. He had his men attack the city the next week, and it looked for a while as though he was going to get us, marines or no marines, but they finally drove him off. I think he recognized me as he was dragged out of the hospital by the

marines; at least, he said some horrible language to me—but I think the operation took away a lot of his pep.

"It was soon after that that the hospital broke up. The last night I was there I managed to see the records. They must have done a lot of those operations. It seems that they had been working night and day for months. Anyway, they quit. The hospital was turned over to the Government as a present, and the girls all went to Shanghai. I gave some of the doctors presents of my jewelry. They were sort of keen about jewelry, even if they were ranting all the time about the equality of the sexes. Then I left the country by the quickest route and came back by way of Europe. I spent a little time in Paris; in fact, I grew a little beard on my way back—I was so tired of shaving three times a day that it was a relief not to have to shave at all. But I suppose I will have to cut it off before I go west; my wife likes a smooth-shaven husband, and, of course, you know, I am a married man, very much of a married man, though I feel that I have almost forgotten the fact for a minute or two during the last half year."

The Chief of the Secret Service of the United States slowly replaced his revolver in the desk, as he sighed,

"You are a remarkable operator, Taine. I do not know of anyone just like you. You are so peculiarly matter of fact. You either have no nerves or you are too dumb to know what danger is. You go over to China and lead that life for a half year —you impersonate a rich Chinese girl; you even go right into that hospital and finally help them operate on your most dangerous enemy in that heluva land, and then you come back and tell about it all just as the average man would tell about a trip to Coney Island. You tell me all about it—about those girls, as you call them, and you do not even intimate that your curiosity was aroused. Personally, I am a rather self-possessed man, but I had all I could do to keep from interrupting you. What were they doing it for? Where did they get all that money? Who was in back of it? And, by the Seven Sacred Beasts! what did they cut out of those poor chinks? You calmly sit there and tell all about it, and you have not told me a single thing I want to know except that the girls are gone and the hospital is being run by men and that they sent some kind of dope to Paris in bottles. 'Pon my word, man, have you no imagination? No curiosity? What did you come back for before you learned the whole story. Something big there. You might become famous! And you sit there and tell about giving jewelry to women. Bah! You ought to be kicked off the force."

"I wish I were," sighed Taine. "This little female dog looks like my old buddy, but she is not half as bright as he was. That's the way with all the women. You ought to have heard the doctors talk in that hospital. Do you know something? I believe there is a secret society of women, something like the Masons. I could sort of feel it, but I have not a single fact to prove it. Now, *if there was such a society*, that might account for part of it. I believe that I just nibbled at one corner of a Brazil nut—like a blooming mouse. It is bigger than we think, Chief; something is going on, and that hospital was just a little piece of it. Now, in regard to the operation: I learned a little about that in Paris. What those girls did was to perform an operation called *gonadectomy*."

The Chief turned red,

"You think you're smart, don't you. Springing a new word like that on a man, just to show how smart you are. What did they do to those men? You tell me or I will have a stroke of apoplexy."

"Don't get excited, Chief," replied Taine, as he put the little black dog back in his pocket. "You would not believe me if I told you—you would not believe half of it, not even a little bit of it. If I told you all that I really think about this, you would accuse me of having become an opium smoker. I had that happen to me once. Remember when the *Circle Internationale* exploded? Well, I started in one night to tell my Chief out in San Francisco about it, and before I got half way through he called me a liar. I don't want you to do that. Here is a written report and the vouchers for my expenses. Of course, I had to spend some money, but I think it will be worth it to somebody. In fact, I think that you are going to call me back to Washington before long, and perhaps when you do I will nibble a little more at that same nut; maybe we shall find it rather rotten. Some of my imaginations about that affair are certainly peculiar. Oh! I forgot to tell you. There is a new College for Women in the suburbs of Paris. Very exclusive, and all that sort of thing. They tell me a lot of American women have been going there for the last two years. Some kind of a finishing school. Women come and go, and there is a high wall around the whole property. No men admitted. Does that sound peculiar to you? Sort of like a Convent. Now, just one thing more, Chief. Those girls in China were shipping all that dope in the little glass bottles to that address in Paris. That is why I looked it up. That is about the only reason I had for going to Paris. Does that mean anything to you? You think about it for a while. Use your imagination."

CHAPTER IV

A Silent Revolution

PERHAPS something might have come out of Taine's trip to China at once had it not been predestined otherwise. The Washington Chief read the lengthy report that night and made up his mind that something ought to be done about it. But then that very night trouble broke loose from the I. W. W., and for the next six weeks every government operator was busy, and, as a result, the report that Taine made was lost sight of. When

it was remembered, its importance was underestimated, and many valuable months passed.

Slowly the masculine minds of America, the great Captains of Industry, became worried over a peculiar state of affairs. The control of many of the leading companies of the nation was passing over into the hands of a new financial group. Many of the banks were being directed by members of the same group. Already they had charge of a great Trans-Continental railroad. Aviation Consolidated was slowly coming under their power, and even Radio and Television Associated Companies, one of the wealthiest of all the new financial giants, was being undermined by their active efforts to secure fifty per cent of the Directorate.

It had just been a few years when the entire charge of these basic industries had been securely in the hands of men between forty-five and seventy, big, two-fisted, go-getters, who knew what they wanted, were willing to pay the price, and who never ceased fighting till they won their objective. Most of them were college graduates, many of them had been, in their undergraduate days, great athletes. Every one of them, even the old men, still loved the open air, golf, and some of them still hoped to live in Paris when they died.

It took them a long time to realize that anything out of the usual was taking place. Even after they realized it and began to resent it, they were uncertain as to the proper action to take. They were big men, but, after all, it took big men to look at a great sociological movement, from a national standpoint; and this thing that was happening was affecting the entire nation.

It was something that was slowly, insidiously, pervading the business life of every State. For some reason, it was hard to analyze, difficult to comprehend; but there was no problem in realizing that the economic supremacy of the giant group of go-getters was being directly challenged.

After all, it was not the fact that their rule was being contested by a new group that bothered them. Had it been just that, they would have been willing to effect some kind of a working compromise and divide the spoils. It was the personality of their opponents that aroused their ire and constant resentment.

In the first place, the new leaders were young men who were hard workers and did not seem to know the value of recreation. They simply seemed determined to drive themselves and all the subordinates under them till the day's work was done and a good part of the next day's work done in addition. They were not only hard workers, but they were efficient, and when they started in to accomplish a task, they usually stayed at it till they won out. Of course, the go-getters, the old timers, had the same determination, but the old men used clubs and bludgeons to accomplish their purpose, and all these young men were smooth; and when they won a financial victory, they did so before their opponents realized what was happening to them. They were smooth, suave, and remarkably clever.

Another irritating quality was their ability to dress well. The old timers spent a lot of money on their clothes, but, for some reason, they never looked well dressed, while these younger men had the peculiar ability of always being just a little ahead of the prevailing masculine fashion. It was not long before the tailors had to admit that they were being dictated to and that these youthful financiers were really telling the tailors what the styles of the next six months would be. Their clothing was masculine, but, at the same time, it had a dash of color to it, a peculiar something that was different. When one of this group walked down Fifth Avenue, his general appearance was such as to make passing women, and men also, turn to look again at him.

Without exception, they were well groomed, took wonderful care of themselves, shaved twice daily, and avoided, in every way, the breath of scandal. In a quiet way, they participated in all forms of civic improvements, and it seemed that everything that they had a hand in succeeded. They seemed to carry around them an atmosphere of success. They seemed to have resources to begin with, and, without exception, they all appeared able to make money.

Socially, they did not fraternize with the old timers. They made no effort to join the ancient clubs that had always been considered the heights of fame. Instead, they established, in every large city, clubs of their own, which, for exclusiveness and fashionableness, seemed in every way to completely eclipse the established social centers of the rich men of the land. It was this very exclusiveness, this tendency to act as though they considered themselves better in some way, that worried the older men. Why the young upstarts would not even accept their invitations to play golf with them!

And, finally, affairs reached such a point that something had to be done, politics became upset. The Millionaires' Club in the Senate at Washington was invaded. And, eventually, one of those sleek young men actually had the nerve to suggest that he run for President, and advanced many excellent reasons why he should be permitted to do so. With that the battle was on!

Yet, even then, no one seemed to have a clear idea of what all the stifled excitement was about. It was all very well to whisper, but what was the use of either whispering or shouting, when there was really nothing to say? Besides, there were just a lot of people who were not backward in stating that the country might be better off in the control of these younger men, and it was all the more credit to them if they were a little particular in their dress and reserved in their manner. At least they were hard workers and could almost always be found in their offices instead of being "in conference" or out on the golf links.

More Mysteries for Taine

THE old business group became uneasy; then they became more uneasy. They finally reached the point at which they actually grew nervous. There had been several raids on Wall Street, gigantic, underground attacks on the multi-millionaires, that increased their anxiety. And finally, they decided that something must be done about it. They had conferences and special investigations, and nothing happened; they were just as ignorant, just as much at sea as they ever had been. Then one day, in utter desperation, one of the big men of the group (a man so big that he sat with a few others in a back room in a hotel and sent word to a Republican Convention whom they should nominate for president) went to Washington, saw the President, and secured from him a written and signed order to the effect that the Secret Service Department should render such aid as was in their power.

Naturally, the rich man saw the Chief of the Secret Service.

After listening to the story of the man from New York, the Chief secretly thought that he was listening to a paranoiac chaser of moon-beams.

"I really do not know what you want my department to do, Mr. Johnson," he finally answered. "It seems that you are afraid of something and yet cannot give me any definite idea of what it is. Certainly you do not fear these men in a business sense. Our department cannot protect you against superior brains of financial opponents. This is a free country. And, with the past success of the group that you represent, you certainly ought to feel competent to deal with them on the stock exchange."

That kind of an answer made Johnson mad. He was not accustomed to it. Yet, at the same time, he realized that it was a well-deserved criticism. He started to answer it, stuttered, stopped, started again, and finally blurted out,

"One of the things that makes us so tarnation mad is the fact that those upstarts are playing bridge all the time, and when we ask them to join us in a real he-man's game, like golf, they always cut us cold—say they are too busy. Yet, they have the crust to put up a twenty-five million dollar clubhouse, the finest in New York, and call it the Bridge Club, and, so far, not one of the men that I know has been invited to join."

"Now that," replied the Chief, "is real news. If you only had a dozen more facts like that, we might have some idea of what the trouble was."

"Well, I am no detective. I thought that was your business."

"It is; but, at the same time, we have to have something to start with. We cannot raid the biggest private club in New York just because some of you gentlemen are sore because you are not invited to join."

"We don't want to join them, but, all the same, the way they act makes us sore. Pretending they are so much better than we are. Won't join us in any of our deals—just won't have anything to do with us—and all the time trying to knife us, secure control of our corporations—why, they even think they should have a voice in who is to be President."

The more Johnson talked, the more positive the Secret Service Chief was that the New Yorker was simply sore and trying to secure revenge for fancied slights or actual financial losses. The Chief was a busy man, and had all he could do with counterfeiters and patriotic citizens who were trying to smuggle jewelry into the country. At the same time, he was a politician. He knew that this man could not be handled brusquely. So, he shut his eyes, leaned back in his chair, and passed into an attitude of deep thought. Meantime, the money-king savagely chewed his pipe stem.

"I think that the best thing to do," finally announced the Chief, "is for you to go out to San Francisco and see Taine, a detective connected with the Department out there. I will give you a letter to his Chief that will help you. He is a wonderful man, a real detective, and he has imagination."

"Why not have him come to New York and see me?"

"I do not think he would do that. He won't work for you at all unless he really wants to. He is temperamental. Yes! That is the thing for you to do. If Taine wants to, he will get to the bottom of this mystery."

Johnson slowly shook himself out of the chair,

"Guess I will go. Some one has to get to the bottom of it, or those up-start, bridge-playing fools will take our clothes away from us. Write your letter, and I will get the next train west. Wish I could travel in a plane, but I am too old for it.

CHAPTER V

A Ring Turns Up

FOR a few years Taine had been having the time of his life. That meant hunting a few murderers of the common variety, running down some opium importations, and even doing a little political work on the side. His monthly salary was not large, but he had some extra cash in the bank, and his living expenses were not great. Three years had passed since his trip to China. Life had become very ordinary, almost commonplace. He was nearly on the point of believing that not much could happen. Then, within a week, a number of unusual circumstances called his attention to the fact that there were several lines of investigation that needed a real detective to work on them. Secretly, Taine thought that he was a great man; in fact, he believed that he was as good a detective as there was in America; at times he even went beyond that and included England and the Continent.

What happened was this: A little fire destroyed the Presbyterian Church and parsonage that was the delight and religious consolation of his wife. Immediate plans were made for their rebuilding, but the heavy part of this financial burden would fall on the Missionary Society, of which Mrs. Taine

had been president for many years. She felt that she should lead in raising the money. She always gave the ten percent of her husband's income, but for the last few years this had not amounted to very much. So, after spending an afternoon with the building committee, she calmly told her husband that she would just have to give the Society one hundred thousand dollars or resign from the presidency. She even cried a little, and the little black female dog howled, and the daughters were sure that papa had done something horrible. Taine told his wife to go ahead with her plans, for, after all, one hundred thousand was ten percent of only one million and he could earn that in no time. Then he took an old envelope out of his pocket and a stub of a pencil and figured out that he was worth, including real estate and insurance, exactly eleven thousand dollars. The next day he wore a troubled look.

That look was deepened by the news that his wife had fainted while washing dishes. She was nearing the thirty-ninth year, but on the three previous times that she had fainted, washing dishes, she had later on presented her adoring husband with a girl baby. Taine had three daughters and was not sure that he wanted any more. So, he rushed home (his wife was all right when he arrived) and insisted that she go at once and see a doctor.

That night all she could talk about was the New Doctor that she had called on. He was such a perfect gentleman, so kind and sympathetic, and had such a sympathetic understanding of her difficulties. There was no addition to the family in sight, but the Doctor had told her that for a few years she would be in a nervous state and should be careful not to be disappointed in any way. He had said that if her husband really loved her, he would see that every desire of her life was granted. Taine promised her that he would see to it that this was the case, and silently he promised himself that he would see this wonderful physician and give him a pointer or two as to how to handle women.

He called on the physician that evening, and gave, as his excuse, a troublesome cough. He found Dr. Williamson all that Mrs. Taine had pictured him—and he found something else. As the Doctor took his history, and later on, as he percussed Taine's chest, the detective saw a rather old Chinese ring on the left hand little finger. He thought that he knew that ring. He was sure that he had seen it somewhere; in an odd way he was also sure that he had seen Dr. Williamson before. All that night he tried to connect the ring and the man and the past, and, when morning came, the solution came with it. That ring was one of the pieces of jewelry that he had carried with him into the Chinese hospital. He had given it to one of the Doctors, and, now, that he concentrated on it, he realized that the lady Doctor in China and Dr. Williamson were very much alike——

Only the one was a woman and the other was a man.

They looked enough alike to be brother and sister.

Perhaps that was the solution.

Or perhaps it was not the same ring after all!

The next day one of the operators started to joke with him in the office.

"Nothing singular about all your children being girls, Taine. You were just a little ahead of the fashion. Did you see the report from the National Department of Vital Statistics? Last year there were three times as many girls as boys born in the United States. They are not shouting about it, but they are doing all they can to find the reason. If that keeps up for a few years, this will be a sure-enough female country."

"Well," replied Taine. "There must be some reason for it. Everything has to have a reason. Now, we had these three girls because my wife is partial to girls, and I guess they are easier to raise than boys are. Of course, three girls to one boy is all wrong. If that keeps on——well, I guess I will go out and find some more opium!"

And that very evening Taine read in the papers about another raid on Wall Street. It seems that Johnson had been away from the Stock Exchange for a few days and his enemies had taken advantage of his absence. Taine read that item out loud to his wife, and even when he was reading it, one of the daughters answered the doorbell and in walked Johnson of New York. He introduced himself, he shook hands with the detective and with Mrs. Taine and with the Misses Taine. He acted like a god, condescending to visit a human habitation, and determined to make the humans like him.

"Have a cigar, Mr. Taine? I presume your wife will excuse us if we smoke?"

"Thanks, but I do not smoke," the detective replied. "Long ago I found that the nicotine was bad for the delicate enamel of the teeth, and once that is destroyed, the teeth soon follow. Now, you go ahead and smoke all you want to, because Mrs. Taine has no objections to it. Girls, you had better go to the nursery and study your lessons. Mr. Johnson may have something to say to us privately."

"I want to talk to you privately, Mr. Taine, if your wife will excuse you?"

"Oh! You can talk in front of my wife. Especially if it is professional business. She is really very wonderful in offering suggestions. In fact, she is my chief inspiration. More than once I have left home and gone to the far off places of the earth for more than a year at a time, and she was my only inspiration to do so. So, go ahead with your problem."

Johnson looked at the little man sitting on the worn haircloth sofa. He shook his head doubtfully,

"The Chief in Washington said you were the only man that would be able to help me. I guess he made a mistake. I am afraid that the problem is too enormous for you."

Mrs. Taine looked up from her sewing,

"You say that because you do not know my husband's ability."

"As a matter of fact," added Taine, "in my best moments I feel that no one fully understands what I am capable of. I am small, weigh about one hundred pounds, and, yet, you can believe me or not, there are times when I seem to be inspired, endowed with superhuman power. I had a medium tell me once that I was a dual personality, and, of course, if that is true, it is a very wonderful asset. I think, if I might be bold enough to advise you, Mr. Johnson, that you can accept me as being just as capable as the Washington Chief says I am. Now tell me your troubles?"

Taine Gets A Commission

JOHNSON surrendered. For over an hour he poured out his story, which grew more and more bitter as he recited it. Taine acted most of the time as though he were asleep, but Mrs. Taine listened with the most intent expression. Finally, she could not contain herself any longer,

"Why, those mean men!" she exclaimed. "They act just like a lot of catty women."

Taine stiffened in his chair, and began to breathe a little fast. Finally, Johnson finished. The little detective sighed deeply,

"I can help you, Sir, but it is going to be a rather dangerous affair. There is all the evidence of a big things happening, and when big things happen, human life does not count for much, especially not the life of a human such as I am. They would kill me just as they would squash a potato bug. But I will go into it and give you a report when I finish, and I won't stop till I am either through or dead."

"You don't mean to say that you have a clue?" demanded Johnson.

"There are a lot of scattered threads. If I told you what each one was, you would not believe me. I believe I see something. Enough to make me want to investigate. I will begin at once, just as soon as you show your good faith by paying me one-half of my fee; the other half can be paid when I make my final report."

Johnson smiled. He saw the threadbare furniture, the "GOD BLESS OUR HOME" and "A GOOD WIFE IS THE NOBLEST WORK OF GOD" signs on the wall, and without hesitancy, he pulled out his checkbook and fountain pen and said smilingly,

"How much?"

"One million dollars for the first payment," and Taine said it without blinking an eyelash. His wife sank back in her chair and closed her eyes. Johnson looked at the man in front of him. Suddenly the New Yorker smiled,

"I will write it at once. Any man that can do that to Johnson can get away with murder.——Here is the check. If you ever make your mind up to go into business in New York, you come and see me. I would rather have you as a partner than an enemy. Now, get busy. I must get back to New York. They are raising Cain with the stock market in my absence. Goodnight, Taine! Good-night, Mrs. Taine! I congratulate you on your having such a husband," and he was out of the house before they could realize it.

"You are wonderful, dear," whispered Mrs. Taine. "Now, I can stay in as president of the Missionary Society. Won't we be proud to see the new church that was built so largely through your efforts?"

Taine refused to smile, as he replied,

"You save enough out of that hundred thousand to put in a Memorial Tablet for your departed husband, because I have an uneasy feeling that when I finish this, it will finish me. I am sure enough scared of those people."

"But you always have been able to take care of yourself?"

"Yes——so far——but then I always had men to work against."

"But I thought Mr. Johnson said these were men?"

"Yes——that is what he said——"

The next day Taine left San Francisco. He did not even take the little black dog with him.

CHAPTER VI

Taine Goes to Work

THERE was no doubt as to the exclusiveness of the Bridge Club of New York city. It was rumored to have cost twenty-five million but that, no doubt, was an exaggeration. It was said to be very elegant in all of its furnishings, and that also was open to question, for no one except the members ever entered its doors, and they were rather shy about whom they invited to go with them as guests. Rumor said that it was really the headquarters of the new business group, that the name was just a cover for other more formidable activities, but no one could either prove or disprove this.

It had been built rapidly but soundly. Its walls were thick and sound-proof; even the best of inventors would have encountered the greatest difficulties in detecting the sounds originating in some of those rooms. The problem of finding out what was happening in that building was thoroughly discussed in Washington between Taine and some other interested gentlemen, and it was finally decided that the only way to secure this information was to go in and secure it; and this was more easily said than done.

Taine had all kinds of ideas. Some he talked about freely with anyone that would listen to him. Others he whispered to himself at the dead of midnight in his bed, and some of them he did not even dare to whisper. After the conference in Washington, he decided that the only way to do a thing was to do it; so, he started in to do it in the only way that seemed practical to him. A thousand wild, foolish plans occurred to him, but always he came back to the same idea—the only way to find out what was going on in the Bridge Club was to

go inside and find out. He was confident that the solution to the entire problem was inside that building—in combination with what was inside of his brain.

Careful investigation in New York disclosed one thing. Every servant working in the Bridge Club was a carefully selected, highly intelligent person. The next interesting thing was that all of the employees were women. That was so very opposite to the rule that, in itself, it constituted a very interesting fact. Here was a club of men, highly moral, very rich and sedate business men, many of whom lived at the Club, and all of the servants were women!

Taine had been a woman in China. He did not like it very much—this idea of masquerading as one of the opposite sex—but he had done it and he could do it again. For a few days he just watched the women come and go through the back entrance of the Club. Finally, he selected one who looked just a little like Taine, about the same height and age, and this little woman had red hair. The detective studied her on the street, in the subway and finally in her boarding house. By the end of a week he had a very accurate idea of her habits. Then he secured a room in a boarding house near-by; an introduction was effected in a neighboring church, and in no time at all Taine was courting the red-haired lady, who turned out to be a telephone operator at the Club.

She was rather flattered to have such a distinguished looking man pay attention to her. Of course, Taine was really rather commonplace, but his manners were elegant, and he had lots of money to spend, and he was so sympathetic, and kind. At the end of another week the red-haired girl was beginning to dream, and even talk a little about her ambitions. Then one night she left in a drawing room for the West, heavily guarded by several determined women. Her room in the boarding house was occupied as usual by a red-haired woman, who spent some hours of the early morning in preparing an elaborate make-up. That morning at eight, Minnie Smith, the telephone operator for the eight hour day shift, passed with other female employees into the rear entrance of the Bridge Club. Once again Taine had accomplished the apparently impossible.

For a week the little detective, in a red wig and a rather gay dress, worked eight hours a day as a telephone operator. He found out a great many things about the Bridge Club. To be exact, he found out about one-millionth part of what he wanted to discover. To say that he was discouraged was a rather mild way of expressing his disappointment. The mystery that he was trying to solve was all around him, in fact, he was able to feel part of it, but nothing happened to make it possible for him to come closer to it. He watched the members of the Club pass in and out, he heard their voices over the telephone, very occasionally one spoke to him as the opportunity presented—otherwise, his time was wasted.

He worked at the switchboard in a rather automatic manner, his past work having enabled him to have eyes in the back of his head and ears all over. Between calls he thought, and, finally, he was satisfied that he was thinking in a circle, ending where he began and producing no results. In reality, his subconscious mind was working far faster and to better effect than his conscious mind, but, of course, he was not aware of that comforting fact.

In final despair, he decided to leave and start all over again, but the night before he did this he had a dream—not much of a dream, but interesting. A number of cats were tormenting a man, attacking and biting him in every possible way, and just as he awoke he heard his wife say,

"They just act like a lot of catty women!"

He remembered the dream when he awoke. In fact, he wrote it on a piece of paper. Then he began to put some of the threads together—the hospital in China, the Doctor in San Francisco who wore a ring that he had given to a woman in China, the fact that all these people played bridge, the clothing that they wore, the resentment which they aroused in the golf-playing money-men of America.

For a week Taine worked hard. As a red-headed telephone operator he put in his eight hours a day. During the rest of the sixteen hours he received strange callers in his small boarding house room. Scientists, psychiatrists, college professors came from all parts of the East to see him, and from each of them he gathered the special little piece of information that they possessed and that he needed. They were well paid for their trouble by orders on the multi-millionaire Johnson. They thought that they were dealing with some mild form of insane crank, but Taine simply kept his colorless personality and found out what he wanted to know; and at the end of an exhausting week the little man had more threads gathered together.

Then, to his delight, he was promoted to attend to the telephone in the Manager's office. He had an idea that there he might have an opportunity to learn something about the real meaning of the Club. He found, to his great pleasure, that from that office ran private wires to all parts of the United States, and that the so called Manager often spent hours in conversation with men of importance all over the country. These calls were all handled by the red-haired operator, and he lost no time in making a list of those who had possession of the other ends of these long-distance wires. He even listened in on some of the conversations, and gathered what he felt was partial evidence, which proved that some of his surmises were correct.

He was sure that in a short time he would have all of the threads gathered together into a real rope of evidence.

Then one day he was kept busy for several hours, connecting the Manager with a dozen of the big

men. It seemed that they had been called to New York for a conference. That meeting was to be held at 9 P. M. that evening in the Manager's office. Taine made up his mind that he would be there. No matter what happened, he just had to be there. He knew that in that conference there would be disclosures of the greatest importance. The telephone conversations had indicated that something great, gigantic, stupendous was brewing in the steaming pot of destiny, stirred by these financial giants. All that afternoon as he worked he cast glances around the office. Where could he hide?

The Big Meeting

THE meeting was held that evening as arranged. It was a peculiar gathering. Probably never, in the history of the world, had there been one like it. At the head of the table, as was her due, sat Miss Patricia Powers, now nearly sixty years old. When her father died, she had been the richest woman in America. Now, she was probably the richest woman in the world. During those years, following her father's death, her financial life had been interesting on account of the fact that every investment that she had made had been directed by another woman. Not a single dollar had been under the control of the masculine sex.

The greatly increased financial ability of the feminine world was shown by the fact that during all those years not a dollar had been lost; every investment had been wisely planned and had brought a rich reward, and the women who had worked thus for Miss Patricia Powers had received, as their reward, the hearty and generous support of this rich woman in all their plans. Thus, she was entitled to a place at the head of the table. She was a rather ugly woman, and her elaborate costume, her garish display of jewelry, her peculiar taste in regard to cosmetics but accentuated this ugliness. Gossip stated that no man had ever offered to marry her. It may easily be seen that this neglect had been a large factor in her conduct during the past ten years.

At the other end sat Miss Martha Belzer, not the one who became so incensed years before because Aviation Consolidated had refused her a promotion which she knew that her ability merited. That Martha Belzer had gone to Europe on a vacation, news had come of her death in the Alps, her body had never been located; this person was a capable looking, well dressed, carefully shaved, financial giant, by the name of Mark Bonds. He had come over from France some years ago, well recommended, and by sheer ability had become a leader in the financial circles of America.

Years before, Miss Martha Belzer had spent a night writing to nine of her friends. Like her, those friends had all met tragic deaths, by fire or water, but always in some out of the way part of the world where their bodies could not be found. Those nine business women had also undergone a metamorphosis.

The twelfth place was occupied by a physician. She was, without question, the greatest biologist of hers, or any other age of history. She and Miss Patricia Powers were women, dressed as women. The other ten persons at the table were the leaders in the new financial movement that was threatening the economic life of the group of old-timers.

Miss Powers started to open the meeting.

The telephone rang, and Mark Bonds answered it from his seat.

After listening intently, he curtly replied in a deep, masculine voice:

"Bring her up."

And looking around, he remarked:

"You know that little red-headed telephone operator? Well, she is raising Hell downstairs and says she has to see us right away. Says she has news that is vital to our interests.

"Do you mean Dorris Bahnes, the one just promoted to be our private operator?" asked Miss Powers.

"That's the one," answered the Manager, smiling as he spoke. Then he went to the door and opened it. In rushed the red haired girl, breathless, her dress torn, her shoes muddy. Gasping, she almost fell to the floor. The great physician personally helped her to a seat and saw that she was given a stimulant. At last she was calm enough to tell her story.

"I know that you are going to punish me," she faltered," I know I done wrong, but how was I to know? About three or four weeks ago I met a man in our church. He treated me swell, and made love to me and then one night when I was on my way home from the Club I was caught by three big women and put in a taxi, and before I could say a word we were on our way to California. They would not tell me a word, would not even talk to me. Everytime I tried to escape, they beat me. Out there I was chained to a bed in a shack on the desert. I thought I would die there. Finally, I got away. The Salvation Army helped me, and I finally reached New York. When I went to the boarding house, the landlady abused me. She said I was a liar, that I had been in New York all the time, and had paid my board regular, and even while we were talking a red haired girl came out of my room with some of my clothes on and tried to catch me, and I ran as fast as I could to the Club for help, and when I heard that you were all here, I was bound to tell you, because something is wrong about it. Has there been a red-haired girl here? In my place?"

The Manager nodded, yes. Then he said kindly:

"You have had a terrible experience, my dear girl. No doubt about some rascal trying to harm you in some way. You sit near me till we get through this meeting and then we will take up your case. In the meantime, I will have our private detectives go to your boarding house and try to find this other woman or whoever it is that is masquerading in your clothing. Your conduct shows

how loyal you are to our movement, so, we will have no hesitancy in discussing matters freely with you. Tomorrow I want you to dictate the exact details to one of our private stenographers. It was certainly a most unusual experience. Now, Miss Powers, suppose we start with our meeting. Miss Bahnes, you just rest. No one is going to harm you now since you have reached us.

"I am so glad," murmured the little girl.

Miss Powers began to speak.

"As President of our Association, I have called this meeting to make a careful survey of what has been done so far, and decide on a course of action in the future. I believe that the time has arrived for our more ambitious plans to start. Dr. Hamilton, will you give us a brief account of your invaluable work for us?"

A Revelation

THE wonderful biologist smiled as she replied: "My work has really been interesting. When, years ago, you asked me for suggestions that would enable you to finally assume control of all America and perhaps the entire world, I had already done some very beautiful work, but, of course, I was handicapped by lack of funds and material. Your organization supplied both. You felt that it was necessary, for a few years at least, to place your financial campaign in the hands of five thousand brilliant, well trained, financiers and business executives. These had to be men on account of the inability of women to even secure a finger-hold on the important positions. You asked me to solve that problem. I did. I asked you for a list of five thousand brilliant young unmarried women, well versed in the business management of great enterprises, who were willing to sacrifice their lives to the accomplishment of our great idea. You furnished me with that list, headed with the names of ten of the most remarkable feminine minds that the world had ever produced. At the top of that list was the name of the brains and originator of the movement, Miss Martha Belzer.

"We built up an organization and went to China. There we secured material for twenty-five thousand ampules of male gonadal solution, highly concentrated and of uniform strength. We purchased our so-called College in France and there, after all forms of imaginary deaths, our five thousand heroines came. First, they were thoroughly treated with radium and the X-ray to produce bodies that were natural, as far as sexual characteristics were concerned, and, after that, each one was given five doses of the substance that I was able to isolate and which, for convenience, I called MALE-FINE XXX. In a remarkably short time, these heroines experienced the desired physical changes, their voices deepened, became wonderfully masculine; they developed such growths of hair on the face that they had to begin shaving once a day. There was also a rather typical change in certain deposits of subcutaneous fat. But why go into all these details? It is sufficient to say that five thousand well educated, rather beautiful women entered our French laboratory and five thousand persons who looked like well-bred cultured men left it. What those five thousand did in the financial world can best be told by some one else.

"That was our first great task. Of course, this had to be done only once, because we felt that by the time that our new men grew old the women would be in complete control, without the necessity of such substitutes. In fact, it may be possible to reverse the process and change some of these heroines back into their original bodies.

"Our next important point of attack was to begin turning the human race into a feminine one. As you know, the relation between the number of male and female babies is very close. For centuries scientists have been trying to influence the sex of the unborn child. The problem was attacked from every possible angle. I was fortunate enough to arrive at what seems to be the correct solution. As you know, we patented a Modified Maternity Food for Expectant Mothers. It was a good food, and, as we sold it at cost and extensively advertised it, it was used by millions of mothers. As a result, last year there were three times as many girl babies as boy babies born in the United States. If we can continue this rate or increase it, we will soon have a feminine nation.

"That brings me to my final dream of a manless world. I feel that our organization can easily be spread over the entire globe. We do not want two sexes in this fair world of ours, not as long as one sex can run it so efficiently. But, of course, that sex has to continue on in its existence; we do not plan to destroy humanity. What I have in mind is the perfecting of *parthenogenesis*. By that I mean the reproduction by virgin females of eggs which develop without being fertilized by the male principle, or sperm cell. This is an actual fact at the present time in certain insects, worms and crustaceans, the most familiar example being that of the aphid, in which a number of parthenogenetically produced generations occur entirely composed of females.

"If worms and crabs can do that, the human female can; and the time is near at hand when we will. Later on, we will consider the production of females from *ovumaters* in the laboratory and thus save our mature females the time and suffering of bearing their young. The growth of the young female, from the egg up to the second or third year of life, will be provided for in our Government laboratories and nurseries. I am at work on these problems now, and, just as soon as we feel strong enough to take over the government, I shall be able to present a perfect plan for the development of future feminine generations that will in no way have the curse of masculine associations.

"As I know you are well aware of our plans, it is useless for me to go into details. Enough for me to say that when the time comes you will not

find my department lagging behind in our effort to make this world perfect by the complete extermination of the hated male element of our population. In all this I have had your hearty support and cooperation."

CHAPTER VI

Mistaken Identity

THE eleven persons around the table heartily applauded the great biologist. Even the awe-struck, red-headed, telephone girl timidly clapped her hands.

"Now, Martha, how about your end of it?" asked the wealthy woman, whose enthusiasm and wealth had made all this possible. The person at the other end of the table, Mark Bond, elegantly attired in the height of fashionable clothing, stood up and smiled.

"We financiers have done well. At this moment we are planning an attack, which, if it succeeds, will put the entire wealth of the States in our hands. There were only five thousand of us who willingly sacrificed our sex to conquer womanhood for the purpose of climbing to success. Five thousand, but what a wonderful group that was! Their names will be engraved in letters of gold in the Memorial that we are thinking of building for them in Washington. The men of the financial world have been but toys in our hands. We have played with them, as a child with his teddy bear, a cat with a mouse. All we have to do is to go onward toward the final glory. For a generation men can stay as messenger boys. Then we hope for a wonderful manless America."

And again the eager listeners applauded one of their greatest heroines.

Miss Patricia Powers smiled. That only made her uglier.

"It seems to me," she said, "that we are going ahead nicely with our plans. I have carefully gone over your reports with the Manager of the Bridge Club. Everything is working out as we want it to come out, but I am sorry to report that quite a few of our brave five thousand are in private hospitals, suffering from a form of nervous exhaustion. Fortunately, we are in complete charge of these hospitals, and, so far, have been able to keep this news from becoming public. I am having a special investigation made of this unfortunate break in our health. We are unfortunate not to have a well-trained psychiatrist in our organization, and we do not feel that it is safe to refer these cases to a man. Otherwise, all is going well. Tomorrow we will start our final attack on Wall Street. Juliette, as Manager of our organization, have you any remarks to make?"

Juliette, known as James Jones, Manager of the Bridge Club, stood up, as he started to answer the inquiry.

"I am sure that anything I can say will be of interest to you. We are certainly fortunate in finding our little red-haired stenographer. Her conduct proves the loyalty of our organization, the high ideals of even the smallest member of the movement. I think that this brave girl should be rewarded. A thousand dollars would not be too much—"

"Oh! Please do not give me anything," murmured Dorris Bahnes. "I only did my duty, and I am sorry it happened, because that bad man might have found out some of your secrets. If you think it safe, I would like to go back to the boarding house and go to bed. I am so tired."

"We will see that you are well guarded," the Manager assured her, and he pressed the button at his desk. A messenger girl answered the summons.

"Any news?" the Manager asked.

"Yes, Sir, your private detectives have a red-haired woman down stairs, and they want to bring her up as soon as you let them."

"Send them up. That was quick work! It did not take them long to catch that female impersonator, did it?"

In a few minutes, three determined women walked in. There was something in their manner that conveyed the impression that they could be rather hard boiled if they came in conflict with a criminal. With them was a red-headed girl. They were not holding her, but anyone could see that they were not going to let her get away. Except for the fact that she was a little better dressed, more carefully rouged, she was the exact duplicate of the red-haired girl, who sat at the table with the Directors of the Bridge Club.

"Now, this is very interesting," began the Manager. "Here by my side is Dorris Bahnes, who has just arrived in town, having escaped from her kidnappers, and there in front of us is a person who looks like Dorris, who has been staying in her room and doing her work at the telephone exchange, and, in reality, all the time she was a detective. Our private detectives tell us that this person is none other than Taine, the great operator from San Francisco, paid by Johnson and his crowd to find out what we are doing in this Club."

She walked over to the girl who was now held on either side by one of the detectives.

"What did you do it for, Taine? How much were you going to get out of it?"

The red-haired girl did not answer.

"How do you like to wear a red wig, Taine?"

No answer.

"Suppose I take it off?"

Silence.

The Manager took off the girl's cap, and then grabbed the mass of red hair. It stuck. The girl cried in pain.

"Bless me!" exclaimed the Manager. "It's real hair. I am sorry that I hurt you, Dorris, if you are Dorris. But if you are, how did you get here and where have you been?"

"What do you want me to tell? Everything?" asked the girl whose hair had just been pulled.

"Yes, come over to the table and tell us all about it."

"You see," said the girl, rather nervously, "this man was good to me and so I reported it to you as our instructions were, and so when he had me kidnapped, why, of course, you knew it all the time. His women took me out to a shack somewhere in the California desert and it was not long before a dozen of our women came out there and over-powered his women and some of them stayed there to guard the three women and the rest brought me back to New York. I have been in New York for about a week, and all of that time I have been in one of the private rooms in the Club. Of course, as soon as I arrived I told the Manager all about what happened; I had to in order to keep my vows to the Organization. That is all I have to say. I am sure that I have done nothing wrong."

"No. You have acted in a wonderful way, Dorris. We are proud of you."

He turned to his fellow members of the Directorate.

"Some of you have been in my confidence during these last few weeks, others know of this for the first time. Johnson, with the group of men he represents, was determined to learn our secrets. They engaged one of the most brilliant detectives in America, a man by the name of Taine. We knew when this enemy of ours went to Washington and when he went to San Francisco. We were informed when Taine arrived in New York. Every time he turned around we had a report of it. We played with him—like a cat plays with a mouse. He had one of our girls kidnapped and she has just told you what happened. Then we made it possible for him to attend this meeting—and he did. He is here now. Of course, we wanted him to know all that he had taken such pains to learn; so, we went right on with the meeting, and I hope you have enjoyed it, Mr. Taine." Here the Manager looked right at the red-headed girl by his side.

Confusion!

THE red-haired girl whom he had called Mr. Taine looked at him and smiled.

"I guess I might as well own up, Mr. Manager. I am not Mr. Taine. I am Flossie Ruffles from the Lyric. My specialty is impersonations. For a week I have been trying to duplicate a red-haired girl, and, for some reason, she gave me five thousand to come here tonight and put on this act. I am sorry if I worried you, but I really needed the money and I thought you would not care. I believe from what you have said that it must have been Mr. Taine, the detective, who gave me the five thousand, though why he should have wanted me to do it, I cannot say."

The Manager looked first at one of the red-haired girls and then at the other. Both seemed genuine. They were as much alike as though they were identical twins. She even went and examined the hair of the girl who had first entered the room. It was as genuine as the other girl's was.

The Manager sat down. For what seemed hours she sat there, her eyes covered with her right hand. Suddenly she jumped up and leaned excitedly over the table.

"That man Taine is in this room!" she cried. "There are twelve of us here at the table, these two girls and the three detectives. One of us is Taine. I know that I am not, and I can vouch for Miss Powers, and I am also sure of Dr. Hamilton and Mark Bond. But how about the others? Dr. Hamilton, I am going to ask you to examine these Directors. Everyone of them, you know, should be a woman. But I am sure that one of them is a man, and that man is Taine."

The men seated around the table looked at each other. One drummed on the polished surface with his finger tips. Tap-tap-rappity-tap-tap. On his hand glowed a wonderful chinese ring. It was the San Francisco physician. He suddenly stood up,

"Suppose I say that I am Taine, Juliette? If I say that, will you spare these friends of ours the humiliation of your proposal—of showing their real sex by your inspection of their bodies?"

The Manager looked across the table at the Doctor—she looked long and piercingly. Then she shook her head—

"No. Lucy, old girl. You are not Taine. I could swear that you are Lucy, the girl that went to China and helped Dr. Hamilton with her work there. Why, I have seen that ring a hundred times."

"But I insist that I am Taine. Let's put an end to the melodrama. These women here may be insane in their ideas, but they are, at least, women. I do not want them undressed—not here. I would rather tell you right now that we have come to the end of the play."

Miss Powers started to laugh, a high pitched, hysterical laugh.

"But suppose he is telling the truth, my dears. For God's sake! stop the acting and get down to business. If he is Taine, let's be sure of it. If it is Lucy, it just means that one more of the poor girls has gone mad. Can't one of you tell? Please find out in some way. If something is not done soon, I shall scream!"

Several went to her to quiet her. One by one the Directors seemed to draw away from the San Francisco man, the physician whom they called in such a familiar fashion, "Lucy." He seemed undisturbed, and yet, at the same time, he glanced in an uneasy manner from one side to another, and both of his hands were now in his Tuxedo pockets.

Finally, the room became quiet. Dr. Hamilton looked at Lucy.

"Where did you get that ring?" he asked.

"Oh! That was my ring one time in China. Do you remember that little Chinese girl whom you saved and thought so much of in the hospital? She

gave you all a piece of expensive jewelry. She gave you a piece of jade, Dr. Hamilton, and she gave the doctor whom you call Lucy this ring. Lucy thought the little China girl rather nice. Well, to make a long story short, I was that little girl. I lived in the hospital with you for some months. The Government sent me over to find out what you girls were doing there. I had some ideas then and during all these years those ideas have been slowly working into definite form. I suspected some of the things you spoke of tonight, yet, at the same time, you went a lot further than I thought sensible people would go. I know a lot about women, but I cannot understand what's the matter with you—unless you really are insane."

Dr. Hamilton shook her head gravely.

"I guess he is right, girls. I remember that little Chinese girl, and he did give me the jade. He would not have known about that unless he had been there. I have heard about him, but I had no idea that he was so damn clever. But is he clever? To get the best of Lucy and come here dressed to impersonate her? And then this chorus girl. Well, he says he is Taine, and I really do not think he has harmed Lucy—just locked her up somewhere. So, the best thing we can do with him is to kill him right away. He knows too much—we can handle this chorus girl, but this man—the only way to keep him quiet is to kill him. I hate to commit murder, but I have been working on this plan for years and I am not going to have it go to pieces just on account of a man."

TELLS OF A TUMOR THAT MODIFIED SEX

Medical Journal Tells of Woman Who Began to Grow Beard—Operation Restored Her.

Special to The New York Times.

BALTIMORE, May 31.—Introducing evidence that the ductless glands may change the sex, Dr. Oscar Riddle of the Carnegie Institute, in an article in the current number of The Journal of the American Medical Association quotes Dr. John Abel, Professor of Pharmacology at the Johns Hopkins University, in connection with the case of a young woman who developed a mustache and a beard and many characteristics of the male and had her sex restored by an operation.

The case of the young woman occurred in England. When her characteristics changed toward male, an investigation revealed a tumor which was making certain glands function in an abnormal manner. It was removed and her restoration to her own sex followed in the course of time

An Illustration how fiction becomes fact.
From the New York Times, May 31.

Miss Patricia Powers agreed with the Doctor.

"You are right, Hamilton," she said. "He knows too much. If he is dead, we will put through our financial coup, and in a week it will not make any difference if they do find out he died here at the Club."

Suddenly the San Francisco doctor, Lucy, who was really Taine, seemed to change. His face grew hard, and his hands, within his coat pockets, twitched.

"Now, you sit down, ladies, and listen to me talk. You are not going to kill me or anybody tonight. There are about five hundred policemen around this building. If I am not out safely by midnight, they are going to find out why. No one is going to leave. You women have played a great game, but it was a selfish, inhuman sort of a game, and you are going to lose out and it's not your fault or my fault, but just one of those happenings that make me believe in predestination. You want to run this world, and have all the men die off and make it a female Paradise, and you forgot there was a God and that He made man just the same as He made woman. I admit that some men are rather bad sort of fools, but some of us are really rather good sorts — take me, for example. My wife thinks I am wonderful—of course, all my boys are girls, but, at the same time, she would have been tickled had the last one been a boy. You go and change your bodies, and try and make men out of yourselves, and all the rest of what you call your programme, and now you think that you are going to win out by killing me. If it were not for the Missus and the kids, I would not mind much if you did, but even if you were able to, what good would it do you?

"I think your Dr. Hamilton is a rather bright expert. I always shall be indebted to her for operating on Ming Foo. She had a wonderful plan and she has worked it out in a wonderful way—but she did not know the Chinese people—not the way I do. I have lived with them and slept with them and I know a little more about them than you would think, just by looking at me. During these last two weeks I have been having long talks with scientists from all over the East. Perhaps your detectives know who they were, though they could not tell what we talked about. But I wanted to learn all I could about that medicine Dr. Hamilton prepared in that hospital, and these men told me. I said so and so and they agreed with me that my idea might be right. What you have said tonight convinces me that I was right.

Taine Explains

"YOU went on with your plans, but you forgot God. He had certain plans for the human race, and it was no part of His plan that women should live on, century after century, without men, as you were preparing them to do. So, this is what

(*Concluded on page 274*)

The Problems of Space Flying

By

CAPTAIN HERMANN NOORDUNG, A.D., M.E.,

(BERLIN)

Translated from the German By Francis M. Currier

© 1929 By Gernsback Publications, Inc.

WHILE the first part of Captain Noordung's article has concerned itself with the more or less technical aspect of the problems of space flying, the present installment goes directly to the heart of the whole question.

Not only does Captain Noordung give us a wonderful idea of the instrumentalities necessary for exploring inter-stellar space, but he considers so many novel points and shows us such an array of amazing new instrumentalities, that he fairly bewilders us.

These articles certainly will make history in that, for the first time they consider the problems of space flying from an engineering standpoint, coupled with a high order of scientific imagination and inventive skill.

There is hardly a problem that the author has not considered carefully from all viewpoints and he has solved some of the difficulties previously acknowledged as almost unsurmountable. In a most brilliant manner, by his invention of new instrumentalities which have not been known heretofore, he sweeps away doubts. And by the way, all of these inventions are based upon sound engineering and excellent science.

Captain Noordung at the same time has revolutionized all of our former conceptions of what a space flyer should be and should do, and the highly suprising results which he gets are no more astonishing than the machines themselves.

There remains the problem of transporting the space flyer into outer space. This, however, can no longer be considered as impossible. If we are willing to spend the money to construct the rocket that Captain Noordung thinks is necessary, it would even today be possible to achieve the results he mentions.

In a series of later articles, we will publish the latest scientific achievements of rocket flyers which are no longer of a theoretical nature, but as is well-known, have already been demonstrated in Germany during the past year.

While it is true that so far we have only seen a rocket-propelled automobile, yet even as this is written, special airplanes are to have an auxiliary source of power developed by the application of the rocket principle and aeronautical authorities have stated recently that the future development of the airplane will be along the lines of the rocket-propulsion. By these planes it is hoped to rise to heights of our atmosphere which have not been explored before.

As is well-known, present day airplane propellers are no longer capable of functioning 10 miles above sea level. A rocket plane will have no such difficulties and may rise to any height, even beyond the atmosphere, where, as a matter of fact, it will function better than in the atmosphere.

PART II

CHAPTER V

The Arrangement of the Spatial Observatory In Three Divisions

ACCORDING to what has previously been said, it may be agreed that technical provisions can be made to enable one to remain in space in spite of the absence of all external matter. And, as has been shown, even the absence of weight would prove no decisive hindrance to living (at least physically, though doubtless it would otherwise), if the various details of life were arranged for in the manner already described.

But since the weightless condition in any case would involve serious inconveniences and, perhaps, might prove injurious to health in cases of long duration, the observatory in space is provided with an artificial substitute for gravity.

According to our previous explanation, the force of gravity being itself a force of the attraction of mass for mass, it can only be influenced, neutralized, or replaced by some other force of mass. In this case it can be replaced only by centrifugal force, if a lasting and stable condition is to result. Centrifugal force serves, in fact, to keep the observatory at its dizzy height; as it were, to hold it up. Centrifugal force is called upon also, though applied in a different manner, to produce anew the sensation of weight.

To effect this would, fundamentally, be very simple: it is only necessary to revolve the parts of the structure, whereby the sensation of weight should be produced about their centre of gravity at proper speed. This would produce the necessary centrifugal force on any object in the observatory and hence a sensation of being pulled toward the rim. It is, however, more difficult to create at the same time the conditions necessary to allow one to enter and leave these rotating parts of the structure simply and safely; to attach electric wires and great concave mirrors, and besides be able to adjust the position of the whole with regard not only to the sun's rays but also to the momentary making of distant observations.

The recognition of these difficulties leads to a division of the entire observatory system into three separate objects: the "rotary house," in which an artificial condition of weight is constantly preserved by rotation (accordingly creating the same condition for life as on earth). This house would then be used normally for occupancy. Second, there would be the observatory proper; and last, the engine house—the last two retaining the weightless condition and being equipped only for their special purposes. They would serve merely for temporary

occupancy by the workers during the performance of their duties.

To be sure, this division of the observatory renders it necessary to take special measures to neutralize the mutual attraction of the separate masses. For even though the attraction may be very slight, on account of the relative smallness of the attracting masses, in the course of considerable time (in weeks or months, perhaps) it would draw them perceptibly nearer together and finally would even make the separate objects meet. They must, therefore, either be kept as far as possible from each other (100 or 1000 meters, perhaps), to make the mutual attraction as slight as possible, (while the inevitable approaching together would be counterbalanced from time to time by recoil action), or else they must be placed as near together as possible and be held apart mechanically, by some sort of props. After consideration the former method seems the most feasible.

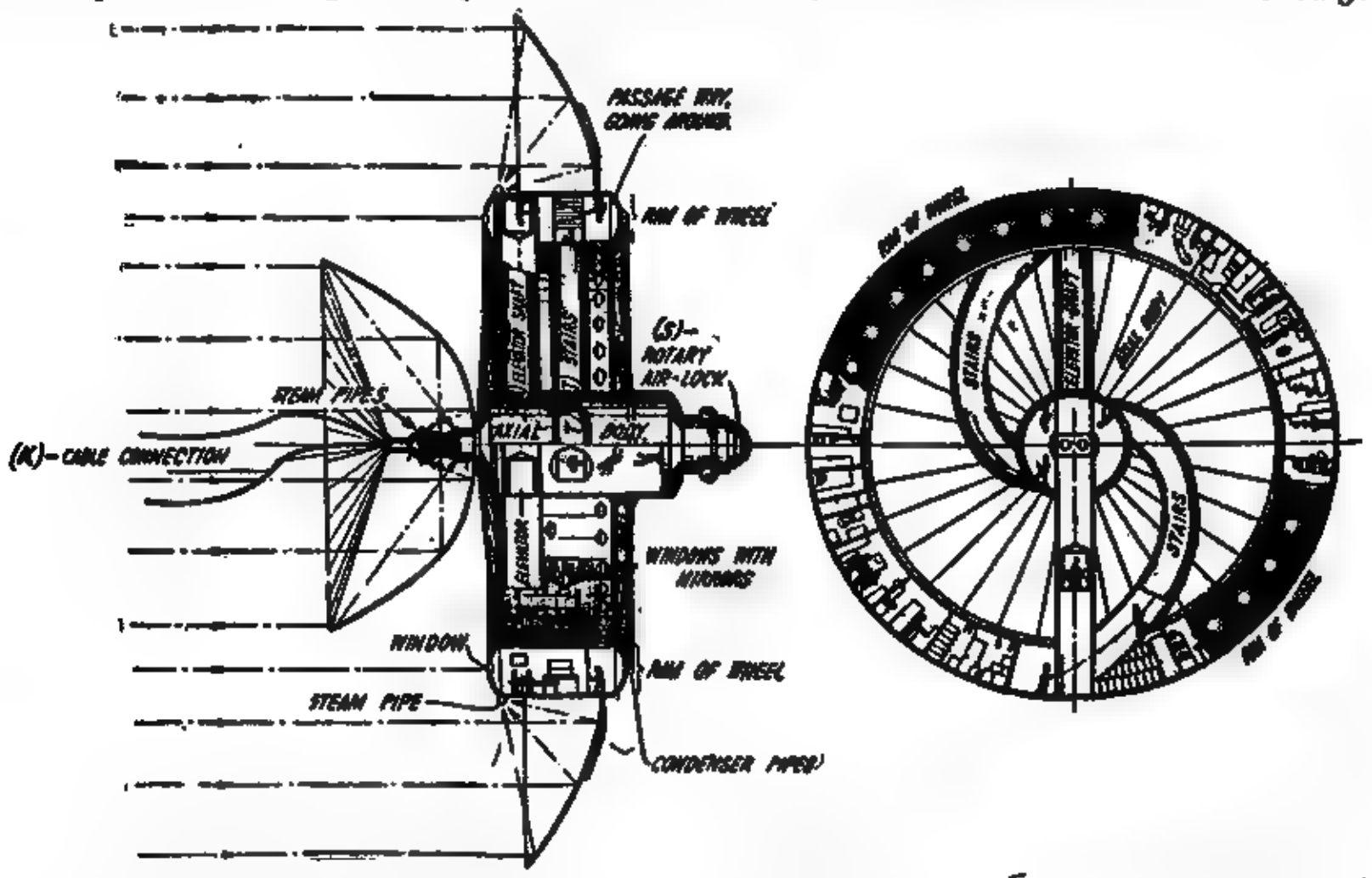


Fig. 24—Two cross-section views of the rotary house in space. At the left is an end view showing the concave mirror and the rotary house proper. The living quarters are near the outer edge of the building, the rooms being built along the rim. A stairway and elevator connect with the axial body and the air lock which one uses to go out into space or return to the building. At the right is a view of the side that faces the sun.

The "Rotary House"

IT is a well known fact that the rotary speed and centrifugal force of various points of a revolving body are proportionate to the distances from their centre of revolution, the axis. The further the point in question lies from the axis the greater the centrifugal force, the nearer it is, the smaller the force. In the theoretical axis the force is zero.

Accordingly, the rotary part of the observatory must be so constructed that the air-locks and cable connections lie on the axis of rotation, because there is the least centrifugal force there. Those parts, however, in which the effect of weight is to be produced by centrifugal force must be on the circumference, because there the centrifugal force is greatest.

To meet these conditions it is best to arrange the structure in the form of a great wheel, the rim being composed of cells and having the form of a ring fastened to the axis by wire spokes. The rim is divided by partitions into separate rooms, all being accessible from a wide corridor going all the way around, and thoroughly enclosed. There are single rooms, good sized sleeping-rooms, rooms for work and study, dining room, laboratories, workshops, dark room; besides the usual kitchen, bathroom, laundry, etc. Everything is furnished in modern comfort; there is even hot and cold water. In general the rooms are like those on a ship. They can be furnished just as on earth; since approximately the normal terrestrial conditions of weight prevail in them.

To attain a centrifugal force on the rim equivalent to the force of gravity on the earth, the wheel must make a revolution in about 8 seconds for a wheel with a diameter of 30 meters (about 100 feet).

But whereas gravity operates toward the centre of mass, centrifugal force operates away from the centre. Therefore in the rotary house "up" means the opposite to what it does on earth; that is, "up" means toward the axis and "down" is outward from the centre (the axis of rotation). Accordingly "down" indicates the direction of the circumference

or "lowest" part, and "up" signifies toward the axis or "highest" part of this artificial world. In view of the small size of our world, all lines (all walls, etc.), must have their prolonged lines meet at the axis. All "vertical" things (such as persons standing up, the partition walls, etc.) are oblique instead of parallel to each other, and everything "horizontal" (for instance, the surface of the water in the bathtub) appears curved instead of flat.

A further peculiarity consists in the fact that, inasmuch as the speed of revolution and the centrifugal force decrease as one approaches the centre of rotation, these quantities are somewhat less for the head than for the feet of a person standing in the rotary house. (With a diameter of 30 meters this change between the head and feet would be about 1/9). The resulting difference in centrifugal force could hardly be perceptible, but the difference in speed of revolution might be rather apparent, especially in the making of up and down movements (following the radial course), such as raising the hand, sitting down, etc.

All these phenomena become less significant, however, as the diameter of the wheel becomes greater. In the selected instance, with a diameter of 30 meters, the effect of the change would be trifling.

Since the arrangements for connection with the outside (the "air lock" and cables) are placed in the vicinity of the axis, the axial body forms a sort of vestibule for the entire structure. It is cylindrical in form. At its ends, the points where the theoretical axis of rotation passes, the air-lock is placed on one side and the cable connection on the other.

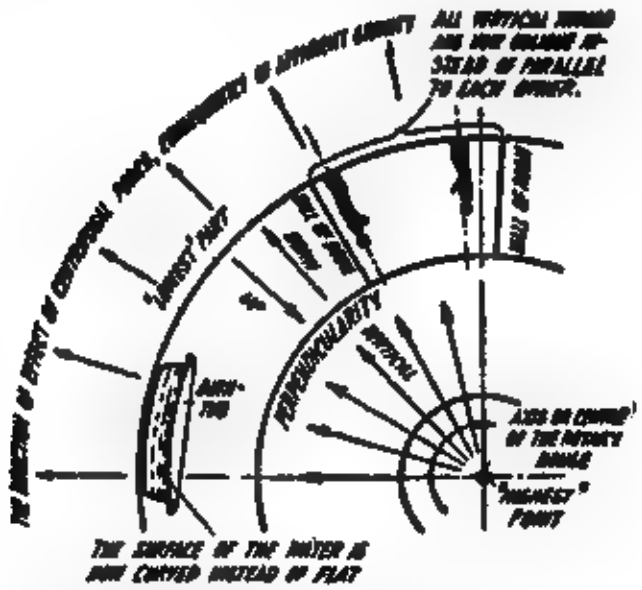


Fig. 25—Diagram showing the new conception of directions in the rotary house. Since the focal point of the house is at the axis, directions are considered in their relation to the axis. Thus the figure of the man standing on the floor of his room has his head toward the axis. Therefore the axis is up. Directions away from the axis radially are down.

The air-lock in this case is rotary, to make easier the passage from conditions existing on the wheel to the motionless condition of space. During the process of "locking out" the "air-lock" rotates at the same speed as the wheel. A person can therefore go directly into the lock. Now it is slowly turned by electrical means, in the opposite direction to the rotation of the wheel, until it reaches the same speed. Thus it becomes motionless so far as space is concerned and the man leaves it exactly as though the wheel were not revolving at all. For "locking in" the process is reversed.

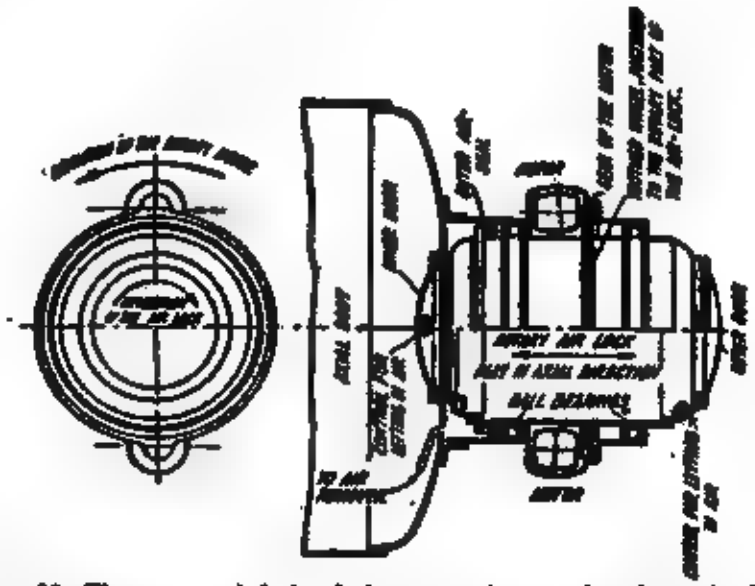


Fig. 26—The rotary air-lock of the rotary house, viewed on the left from above and on the right in axial cross-section. (Compare cross-section of the entire rotary house as well as the text referring to the use of the air-lock). The ball bearings are so arranged that they allow play in the axial direction, making possible the closing or opening of the outer air-seal which joins the air-lock to the inside of the rotary house in air-tight fashion, when the inner door is open.

With some practice the turning of the air-lock can be eliminated, since the rotary house revolves rather slowly (one complete revolution in about 8 seconds, in the case of a diameter of 30 meters).

The cable connection at the other end of the axial body is arranged in a fundamentally similar manner, to prevent the twisting of the cable by the revolving of the wheel. The cable accordingly runs from the end of a shaft, which is arranged in the theoretical axis of rotation and is constantly operated by an electric motor in such a way that it turns at the same speed as the wheel but in the opposite direction. Consequently, the shaft is always motionless with respect to space. As a result, the cable cannot be affected by the rotation of the wheel.

The axial body and the rim are joined by stairs and electric elevators, placed in separate tubular shafts. The elevator shafts run vertically (that is to say, radially). The stairways, however, which have to be inclined, are bent in spirals, in view of the diverging of the perpendicular, becoming steeper toward the "top" (the axis), proportionate to the constantly decreasing effect of weight (centrifugal force) in that direction. By making the progress toward the centre slow either by the stairs or elevators, the transition from the condition of weight prevailing in the rim of the rotary house to the weightlessness of space may be made as gradual as is desired.

Equipment of the rotary house with light, heat, air, and water takes place in the manner previously indicated for the spatial observatory, using the devices described there. There is this difference, that

in heating it, the side of the rim which is always turned toward the sun is painted dull black. The other external surfaces of the structure have an absolutely mirror-like polish. Of course, the heat for the rotary house could be entirely provided by heating the air to be used in the rooms. In that

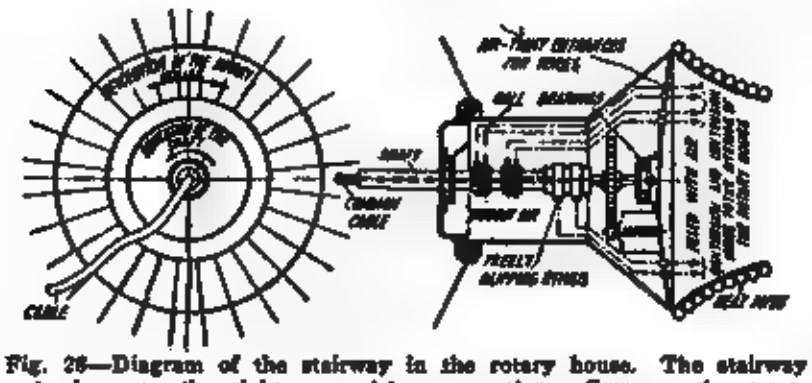


Fig. 26—Diagram of the stairway in the rotary house. The stairway end view; on the right an axial cross-section. Compare the cross-section of the rotary house, with the text, to understand the cable connection.

case the entire rim would have to be polished. There is also a small sun-power plant sufficient for any needs of the rotary house.

The Observatory Proper and the Engine House

THE guiding thought in the construction of the rotary house is the maintenance of the most favorable living conditions possible. But in the case of the observatory proper and the engine house this must yield to the necessity of making them, first of all, suited to their special work. For this reason, as was already mentioned, no attempt is

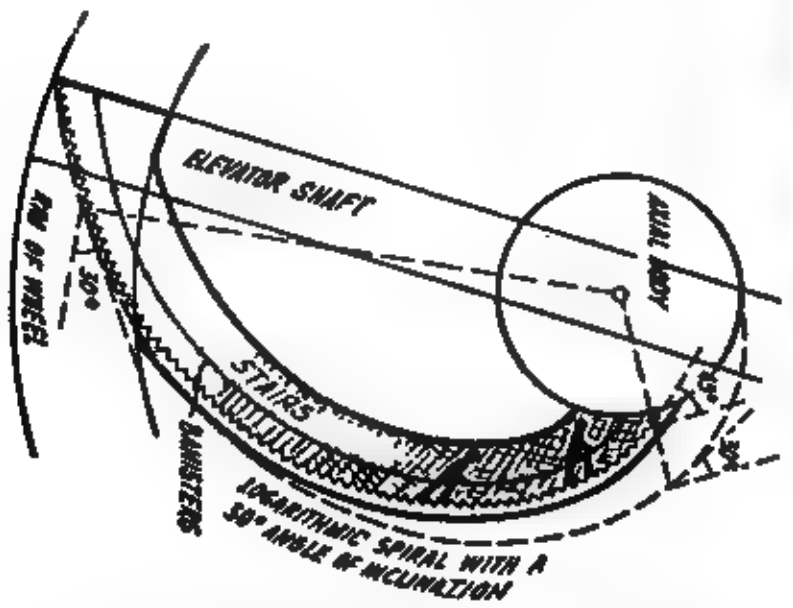


Fig. 28—Diagram of the stairway in the rotary house. The stairway must be built in a spiral (a logarithmic spiral) in order to make ascent possible. This is because as one ascends or descends the centrifugal force acting on him is changing, and the manner of his ascent or descent must correct for that.

made to eliminate in them the condition of weightlessness.

For the observatory, it is principally important that any desired position in space, which may be demanded by the observations to be made, may be given it, therefore, it must be entirely independent of the position of the sun and must have none of the previously described devices operated by the sun's rays. The air and heat for the observatory, therefore, as well as its supply of electricity must depend on the engine house. Accordingly, the two are connected not only with a cable but also with a flexible pipe-line Provision is made, however, that in case of an emergency, the airing of the observatory may be managed independently by using purifying cartridges in much the same way as is customary in modern diving suits.

In the observatory, there are, first of all, in keeping with its chief purpose, the devices for distant observation. There are, likewise, all the controls, the operation of which depends on distant observation, such as the controls of the spatial mirror (for this, see later sections dealing with "A Giant Floating Mirror" and "The Most Frightful of Weapons"). Lastly, there is also a laboratory for investigations in a weightless condition.

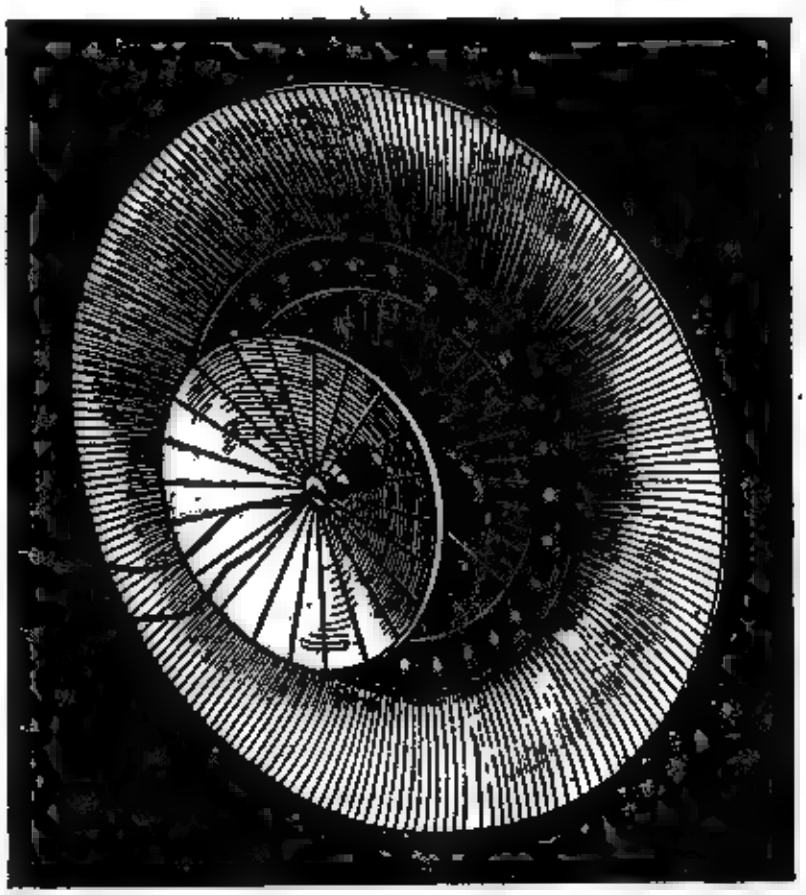


Fig. 29—View of the sunny side of the entire rotary house in space. In the center is seen the concave mirror in the center of which are the steam pipes. Back of the mirror is the rotary house proper, showing the axial body and the living quarters in the rim. (The small white dots represent port-holes). Along the outermost rim is a secondary mirror for heating other steampipes. The electric cables are seen leading from the axis of the house.

The engine house is intended to contain the more important mechanical systems common to the entire observatory, particularly those utilizing the sun's rays on a grand scale. Accordingly, it contains, first of all, the chief sun-power plant with its storage battery. There is also the entire apparatus of the great radio station, as well as an aeration-plant serving, at the same time, for the observatory proper.

The access of solar energy is due to an immense concave mirror solidly connected with the building. Within the focus of the mirror are the vaporizing and heating pipes, while the condensing and cooling pipes are behind the mirror.

The position of the engine house is therefore predetermined: it must always be kept so that the sun's rays strike squarely on the front of the concave mirror.

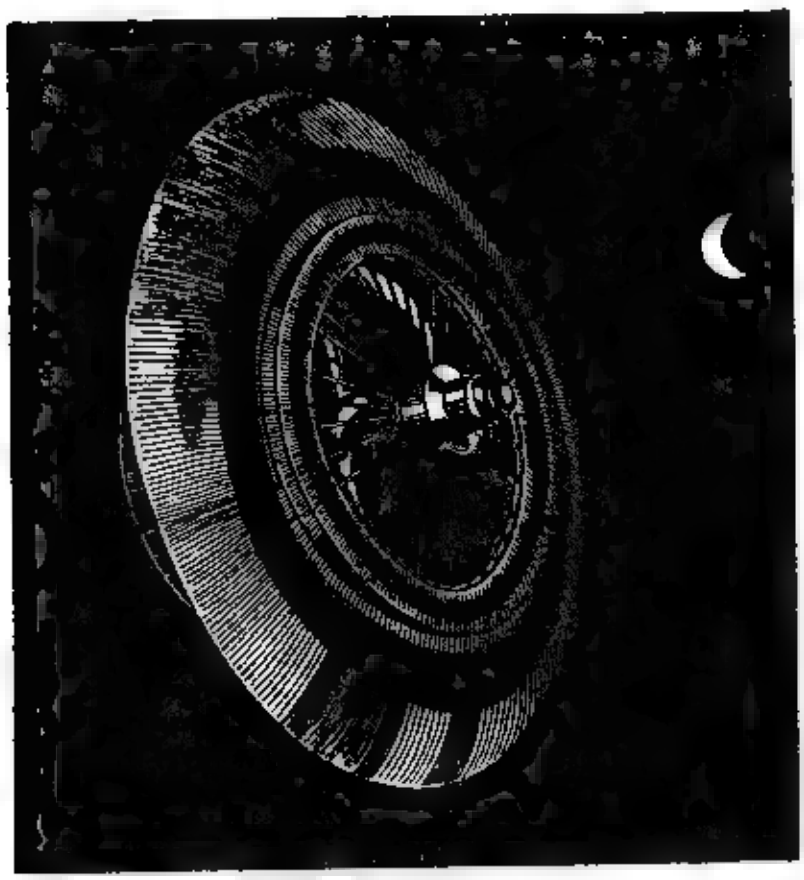


Fig. 30—View of the shady side of the rotary house, the moon being seen in the distance. At the right side of the axis of the house is the air-lock which one uses to go into the open or to return to the house.

Both the observatory proper and the engine house are illuminated in the manner already generally described for the entire establishment in space. The outer surfaces of the structures are kept absolutely mirror-like to lessen the cooling by radiation. Finally, both structures are equipped with rotary motors and recoil devices.

Kitchens, water purifiers, and equipment for washing, etc., are not provided in them in view of the very inconvenient behavior of liquids in a weightless condition. For eating and care of the body, the rotary house is available. Whatever is needed in the observatory and engine house in the way of food and drink must be taken there by each man from the rotary house, already prepared in a manner suited to the weightless situation.

CHAPTER VI

Provision for Distant Communication and For Safety

COMMUNICATION between the separate objects of the system takes place either by light signals or radio or simply by communication over wires. Accordingly all three parts of the space flyer are provided with their own local radio stations and are connected by a cable, which serves also to carry the high tension wires.

Finally, each of the three buildings is provided with reserve supplies of food, oxygen, water, heating material, and electricity (in storage batteries), so that the entire force of men in any building can exist for some time, if by chance the two other structures should become unserviceable at one time. In this way, the division of the system into three parts, favored on technical grounds, contributes materially to safety. To increase the safety still more, provision is made so that each building can communicate with the earth, not only by means of the main radio station, but independently by means of its own blinkers.

The Arrangement of the Spatial Observatory In Two Divisions

THE observatory could be arranged in only two instead of three parts, merely by combining the rotary house and the engine house. Basically this would be possible, because the position of both these objects in space is determined in the same way, by the direction of the sun's rays.

If it is desirable to keep the mirror of the engine house from revolving with the rotary house (for the speed would be comparatively rapid for its size) both the rotary house and the engine house (along with the mirror) could be revolved on a common axis—but in opposite directions. Or the rotary house and the engine house could be completely joined in one structure, on the axis of which the great mirror of the engine house alone revolved in the opposite direction.

The advantages of this arrangement would be as follows: first, the travelling about within the system would be reduced; next, there would be no need of the mechanism necessary in the separate arrangement to neutralize the mutual mass attraction of

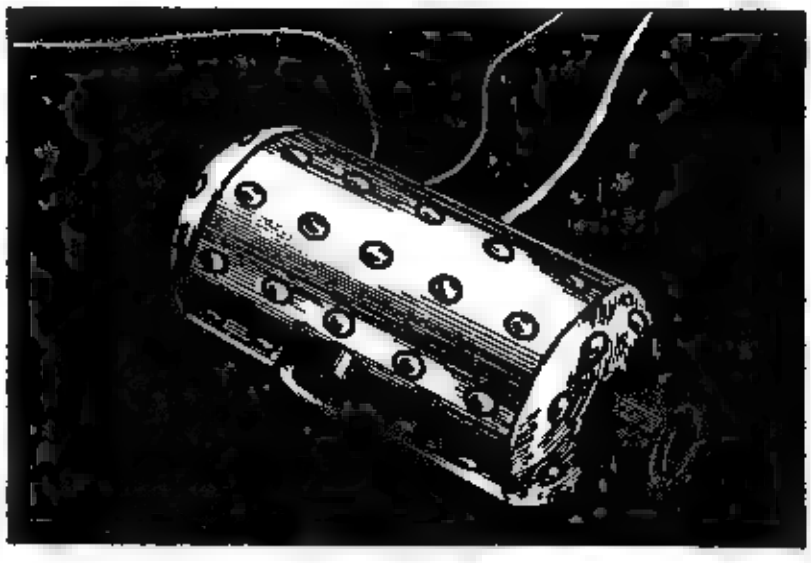


Fig. 31—View of the observatory proper. It has approximately the form of a steam boiler to withstand the difference of pressure, between outside and inside of one atmosphere (14.7 pounds per square inch). The air-lock, two electric cables (left), the flexible air-pipe (right), and the windows are shown here.

the rotary house and the engine house; finally, the rate of revolution of the rotary house could be changed in any way by motor power; that is, without using any operating material. For this purpose either the entire engine house or the great mirror, according to the arrangement, would be

available as a counterweight. This explains the reason for the opposite direction of rotation.

Against these advantages must, however, be placed the disadvantage that this method presents

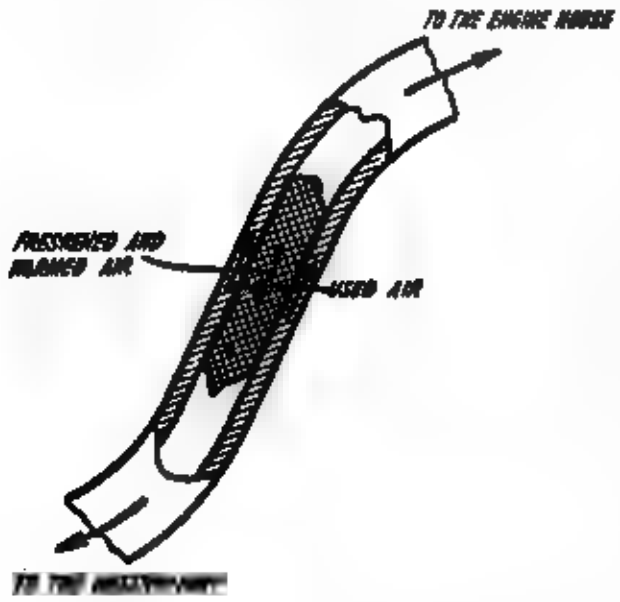


Fig. 32—The flexible pipe line that will connect the observatory with the engine house proper. It has two concentric parts. In the inside pure air is sent to the observatory to provide oxygen for the workers there. The outside pipe is for the return of used air to the engine house.

considerable, though perhaps solvable, difficulties of construction. We shall not give a more detailed account of this arrangement of the observatory system, in order not to confuse the picture already presented.

The Space Suit

NOT only for constructing the spatial observatory system, but also for operating it (for travel between the separate objects, to and from the space ships, for doing various work, etc.) there is need of being able to remain in them (outside of the closed rooms). Since this is possible only with the aid of the "space suits" already mentioned, we must now consider these more in detail.

They are, as was remarked, similar to the modern suits used for diving, or for protection against gas. The covering, however, must be something more than those used in the case of diving suits and the like. For whereas the former must be airtight, resistant to outside influences, and so made that they allow the freest possible movement, in the case of space suits they must also possess great tensile strength. For it must be remembered that within the suits there is a pressure of air of an entire atmosphere. Furthermore, the material of the covering must not be sensitive to extremely low temperatures, such as may result from radiation into space. It must accordingly, under such conditions, not become brittle or otherwise lose its solidity. There is no doubt that very considerable problems are presented in the solution of a material for the covering of such a space suit.

Certainly the greatest difficulty is offered by the problem of keeping the loss of heat by radiation within endurable limits. It is therefore necessary to try to limit the power of radiation of the covering to a minimum. This purpose could most easily be attained by making the entire outside of the suit mirror-like. In that case it would certainly have to consist entirely of metal or at least be coated with it. Perhaps, however, a properly prepared flexible material, insensitive to extreme cold, would serve as a covering, if colored an absolute white and made as smooth as possible.

To be sure, the advantages of such a suit in the matter of freedom of movement might not be very great. Even if the covering used is naturally flexible, it would become stiff, since the suit when inflated by the internal pressure becomes taut. Sufficient freedom of motion would be prevented. The effect would be literally the same as though the covering consisted of a solid material, such as a metal. Since we already have much experience, from modern diving armor, about the making of such rigid suits (so that they might perhaps be given in part a similar texture to that of flexible metal tubes), the most logical method clearly appears to be the entire metal construction.

We shall assume that the space suits are made in that way. Their cooling through radiation is prevented so far as possible by the polished condition of their entire outside surfaces. A special padding of the entire suits also assists considerably the insulation of heat. In the case of a very long stay

Fig. 33—Cross-section of the engine house. The white lines show the sun's rays striking the mirror and being reflected to the steam pipes (vaporizer tubes) where they converge to produce the necessary heat. The condenser pipes are located on the shady side where they can radiate off the heat of the vapor. The body of the engine house is shown as well as the air lock on the right hand and left hand ends of the axis.

in the open, if the cooling off becomes noticeable, it is counteracted by the radiation of mirrors placed on the side of the suit away from the sun. The air supply is provided as in modern diving armor. The necessary oxygen cylinders and cartridges to purify the air are contained in a metal knapsack on the back.

Since oral conversation through airless space is only possible by telephone and a wire-connection would be impractical, the space suits are provided with radio equipment. A small tube set, operated by batteries, and serving as sender and receiver, is also contained in the knapsack. The microphone and telephone receiver are built solidly into the helmet. As antenna, there serves either a properly attached wire or the metal of the suit. Since each individual building of the observatory is equipped for local radio communication, persons floating in the open can converse not only together but also with the interior of the observatory, just as in a room filled with air, though not by air waves, to be [illegible].

For special security against one already mentioned danger which always threatens when one remains in the open, that of floating off into space, the local radio stations are also provided with a very sensitive alarm apparatus, suitable for chance calls for help from persons in space suits even at great distances.

To avoid mutual interference, different wavelengths are, of course, fixed for the various types of local communication, the radio sets of the space suits being readily tuned to these.

To confer the ability to move, there are small recoil devices operated by hand. The containers of the operating material are in the knapsack along with the previously mentioned articles.

CHAPTER VII

The Trip to the Spatial Observatory

TRAVEL between the earth and the observatory takes place by means of rocket space ships. It may complete the picture to go through a trip in full detail.

The space ship is ready on the earth. We enter the passenger compartment, a small room built inside the hull, serving to hold the operator and the passengers. The door is shut from within and made airtight. We have to lie down in hammocks.

A few levers touched by the operator, a slight trembling of the ship, and in the next moment we feel as heavy as lead. The cords of the hammocks press almost painfully into our bodies, breathing is an exertion, lifting an arm is a real test of strength —the ascent has begun. The motive force is working and lifting us with an acceleration of thirty meters a second, which we feel as a fourfold increase of our weight. To stand erect under this load would be impossible.

Before long the increased feeling of weight ceases for a moment, to be renewed again immediately. The operator explains that he has just uncoupled the first section of the rocket, where power was used up, and has started the action of the second.

Soon the operator touches the lever again. We have, as he explains, already attained the highest

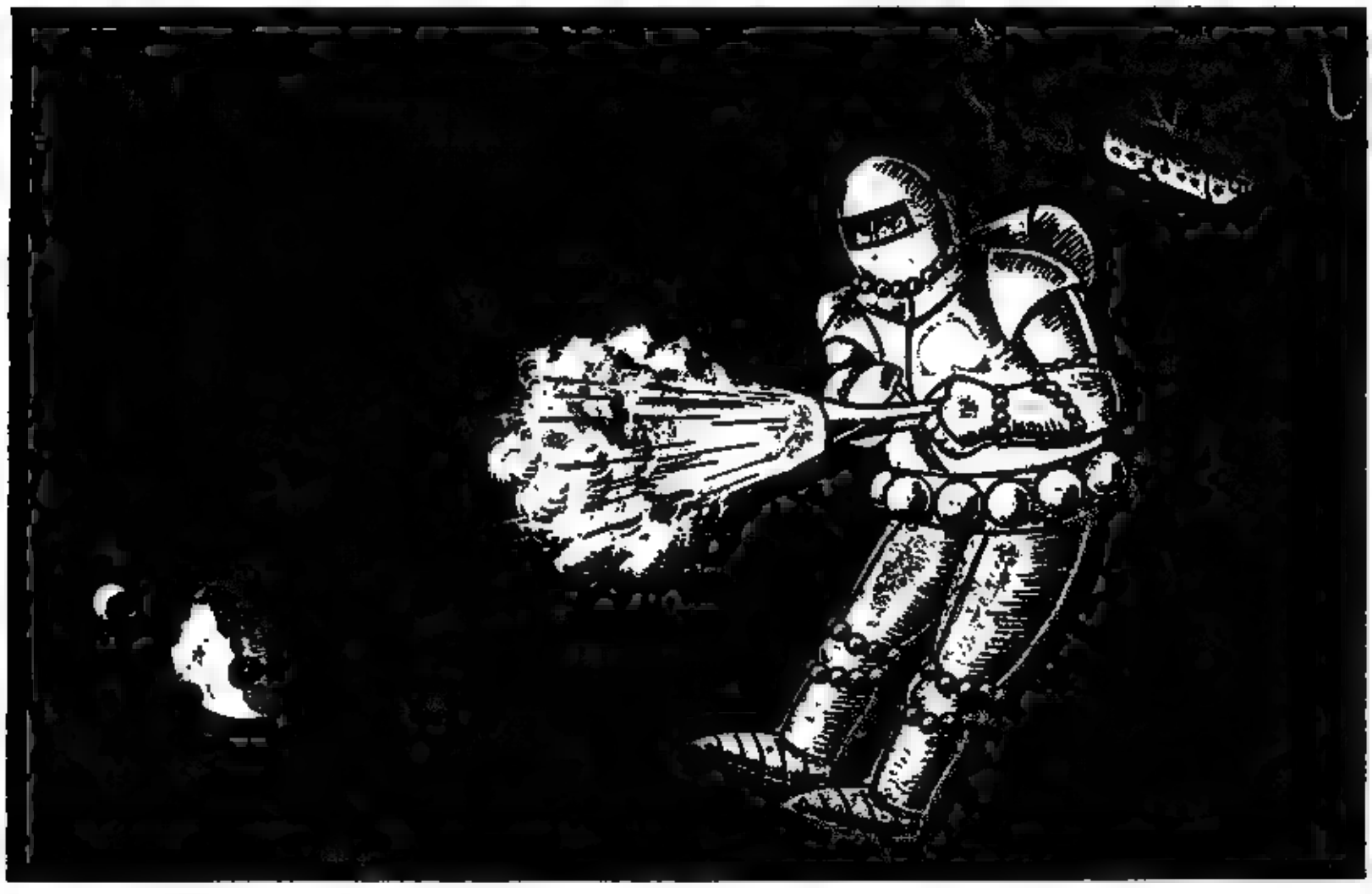


Fig. 34—A man traveling through space to the observatory proper. He is clad in a metal suit with a knapsack on his back holding the oxygen and radio set and other equipment necessary. He is propelled by the reaction from the force of the discharge of the gun in his hands. The observatory is seen in the upper right, while on the left are the moon and earth.

necessary climbing speed; therefore the ship was turned ninety degrees so that the impulse now operates horizontally, to bring us to the necessary speed of revolution.

We have already reached this, too. Only a few minutes have passed since the start, but it seems to us that we have had to endure endlessly the oppressive condition of increased weight. Now the pressure weighing upon us is gradually diminished. At first we feel welcome relief, but afterward comes oppressive fear: we think we are falling, plunging without a stop into the depths. The brave operator strives to calm us: he says that he has slowly decreased the power; our motion is now due only to our own kinetic energy. What we feel as falling is nothing but the feeling of weightlessness, to which we must accustom ourselves. *Easier said than done!* But since we must endure it, we finally succeed in making our mental readjustments.

Meanwhile, the operator has closely watched his instruments and heeded his tables and curves of flight. Several times the driving power must be started anew for a short time, to correct the slight errors in our course.

But now the goal is reached. We have put on the space suits, the air is released from the compartment, and the door is opened. Before us, at some distance, we see a very strange thing, a thing that contrasts with the jet-black sky all sprinkled with stars. It is a thing with a metallic gleam in the dazzling sunlight—the spatial observatory.

We are given little time to stare. Already our operator is pushing off from the rocket and floating to the observatory. We see him a lonely little figure in immeasurable space. We follow him, though not with very pleasant feelings. Between us and the earth yawns an abyss of nearly 36,000 kilometers!

For the return trip to earth we find our rocket ship provided with wings. During the ascent these were carried in sections and were now mounted, a task of no difficulty in view of the absence of weight.

Again we enter the passenger compartment of the space ship. The door is shut and air is admitted. At first the impulse begins to operate very slowly. A slight feeling of weight commences. Again we have to lie down in the hammocks. Then, gradually, the operator connects more exhaust pipes, so that the feeling of weight increases. This time we feel it much more oppressive than before, after we have been accustomed for some time to an absence of weight. Now the impulse is working to capacity, horizontally indeed, but in the opposite direction to that taken before. It is a question of so greatly diminishing our speed of revolution and at the same time the centrifugal force which carried us in our visit to the observatory, so we may freely fall to the earth in an elliptical path. During this part of the return trip the weightless condition again prevails.

Meanwhile we have already come sensibly nearer the earth. Gradually we also enter its coating of air; already the air resistance is noticeable, and now begins the hardest part of the journey, the landing. For now it is necessary to slacken our speed, so gradually during our fall to the earth that there will be no melting of our ship through the heat generated by friction of the air. For the speed acquired may reach twelve times that of the velocity of a bullet.

As a precautionary measure we are all fastened in. The operator is fully occupied in guiding the wings and parachutes, in determining the position of the ship, in measuring the air pressure and the external temperature, etc. For hours we thus madly circle about our planet. First there is a straight flight at a height of about 75 kilometers; later, with a constant decrease in speed, we come in a long spiral nearer and nearer to the earth and thus enter lower and denser layers of air; gradually

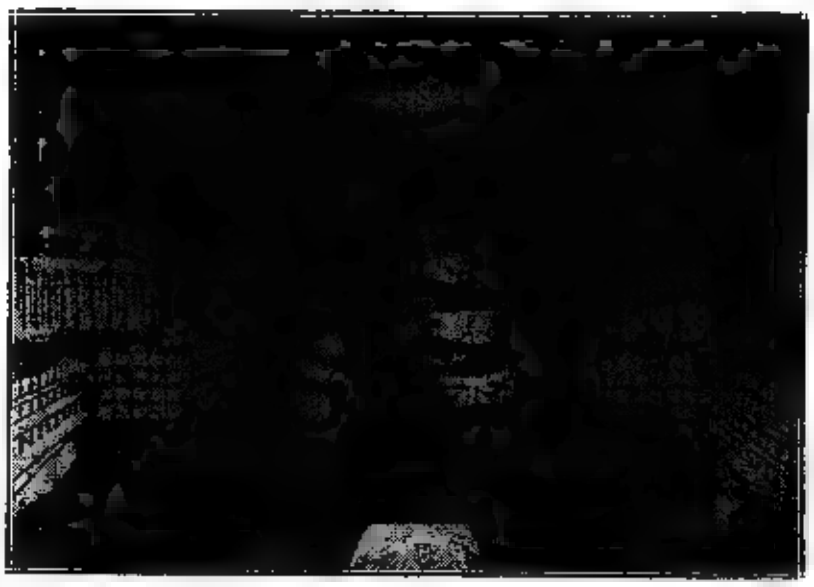


Fig. 35—That the Germans are taking space flying perhaps more seriously than the rest of the world is best shown by some of the science fiction films which they are now turning out. This illustration shows the departure of the space flyer, it being filmed at the instant it is hurled into space. It is of course, propelled by electricity. The film pictures a scene two thousand years hence. (See also Figure 36, showing the inside of the space car).

the terrestrial feeling of weight sets in, and our flight changes into a normal glide. As in a mad race, the surface of the earth speeds by below us; in mere half hours we cross entire oceans and traverse continents.

Yet the flight becomes slower and slower, we come nearer to the earth, until at length we descend upon the sea near a harbor.

CHAPTER VIII

Special Physical Investigations

AND now for the important question, of what use to us is the spatial observatory we have discussed? Oberth has given many interesting suggestions concerning this, and much of what follows is due to his hints.

For example, special chemical and physical experiments could be undertaken, those that demand

large and absolutely airless spaces or require the absence of gravity; such investigations in short as are impossible to carry out under earthly conditions.

It would also be possible to produce not only extremely low temperatures more easily than on earth, but also to come at the same time much nearer the absolute zero than can be done in our chilling laboratories. So far we have come within about one degree of absolute zero, that is to —272 degrees Centigrade. In the observatory in space, besides the usual process of helium liquefaction, there would be available the possibility of most extensive chilling by radiation into space.

We could also test the behavior of bodies in a condition of almost absolute absence of heat. This might lead to extremely valuable conclusions regarding the structure of matter as well as the nature of electricity and heat, conclusions that similar experiments undertaken in our chilling laboratories are unable to furnish. From these experiments might result, for instance, the solution of the problem of finding a process for using the tremendous amounts of energy bound up in matter.

Finally, in view of the special possibilities offered by a spatial observatory, the question of the

Fig. 36—Here we see the interior of the space flyer as depicted in the latest German science fiction film. (See also Figure 35, showing the outside of the space flyer). In this illustration we see graphically what is happening when the space flyer arrives at a point where weight no longer exists. In this German film, the actors actually were made to float about space—as now they have no weight—in a most entrancing

Northern Lights might be definitely answered, likewise that of certain rays in distant space, as well as of many other still unexplained natural phenomena.

Telescopes of Immense Size

AS previously explained, there is, in space, because of the absence of air, no optical hindrance to prevent the use of any size at all of devices for distant vision. But also from the structural standpoint the conditions are very favorable, in view of the prevailing absence of weight. Likewise the electrical energy needed to operate the devices or their parts is available in the spatial observatory.

Thus, it would be possible, for instance, to make reflecting telescopes kilometers in length very simply by placing, at proper distances from the observer, parabolic mirrors (adjustable by electricity) merely floating in space. Such devices for distant vision, and similar types as well, would be vastly superior to the very best ones existing on earth today. One may even say that there would be almost no limit at all to their efficiency and therefore to the possibilities of distant observation.

Observation and Study of the Surface of the Earth

WITH such powerful telescopes everything on the surface of the earth, down to the smallest objects, could be recognized from the spatial observatory. Thus it would be possible to perceive optical signals sent from the earth by the simplest means, thus keeping exploring expeditions in touch with their native lands at all times. Unexplored lands could also be investigated, their terrain determined, general conclusions reached about their population and their accessibility. Valuable preliminary work therefore could be done for expeditions planned, and even photographic detail maps could be furnished for new lands to be visited.

This indicates that *cartography* would rest on an absolutely new basis; for by means of *telephotography* not only could entire countries and even continents be mapped from the observatory (a task requiring otherwise many years and corresponding amounts of money), but also detail maps on any scale could be made, not surpassed in exactness even by the most scientific work of surveyors and mappers. To the latter would remain only the task of putting in contours. Above all, the still little-known regions of the earth, such as Central Africa, Tibet, Northern Siberia, the Polar regions, etc., could be mapped very exactly without much trouble.

Furthermore, important sailing routes could be kept under observation (at least by day, cloud conditions permitting), to be able to warn the ships in time about dangers such as floating icebergs, approaching storms, etc., or to announce immediately shipwrecks which had already taken place.

Since, from the observatory, the cloud movements of more than a third of the earth can be seen at one time, while cosmic observations not possible from the earth can be undertaken at the same time, entirely new bases for weather prediction might result.

By no means, of least importance, is the strategic value of such possibilities of distant observation Spread out like the map of a war game, there would lie before the eyes of the observer in the spatial station the entire battlefield and its approaches. Even with most careful avoiding of any movement by day the enemy would hardly succeed in hiding his plans from such "Argus eyes".

(*To be concluded*)

The Radium Pool

(*Continued from page 229*)

"'What are you doing here?' a strange, silent voice seemed to ask.

"In answer my thoughts asked the same question and instinctively my lips blurted out the words evasively. The awesome creature snapped his frog-like mouth and his antennae stood rigid.

"'Answer me! The silent demand was hostile under the glare of his owlish orbs.

"My hand hung close to the butt of my gun but I kept my fingers from touching it. My brain was a whirl of thoughts, making clear thinking impossible. There seemed to be a peculiar power continually stirring my brain, building up slowly an explanation for our presence there. I opened my mouth to speak but the strange power ordered me to keep it shut and to think. I looked around for Sands. He was standing at my side, his face as green as the ghastly faces in front of me. I felt somewhat assured by his presence and then my thoughts raced, omitting no episode of the long search by my partner for his sweetheart, Allie Lane. My thoughts told of tracing Allie and her father to the radium pool and how, on discovering the cave, we had decided to search within it for some remains of the ill-fated friends of Sands.

"In my excitement I blurted the question: "'Has anyone here ever heard of Allie Lane—have you ever seen her?'

"The big fellow turned his tubes towards Sands as though to question him. Sands must have been thinking terrible things about the grotesque beings who stood around us, for the big fellow reached out a rubber-like arm and suddenly circled it around his neck. Jerked from his feet, Sands fell to the floor with a curse.

"'Get him pardner!' he yelled at me. 'Shoot him!'

"The suddenness of the hostile move against my friend naturally forced me into action and in spite of the peculiar heat in the metal of my gun, I drew it from its holster and fired point blank into the big fellow's face.

"I expected to see him fall and the others dash away but the fellow merely croaked like a frog and tightened his hold upon Sands. A small, round hole appeared in his face where my slug had struck him just below the left eye. A yellow liquid that glowed like fire, trickled out of the hole for an instant, then vanished as the wound rapidly closed up! I jammed my gun into the holster, amazed and fearful.

"Instantly the circle of strange creatures tightened around us. We were doomed men, I thought, as I was roughly lifted into the arms of one of the frog-faced beings!

(*To be Concluded*)

What Is Your Knowledge of Science?

Test Yourself by This Questionnaire

1. What is parthenogenesis? (Page 260).
2. How much energy does the sunlight give us per unit area? (Page 238).
3. What are the rare gases of the air? (Page 239).
4. What might be the physical sensations of one coming near a great quantity of radium? (Page 224).
5. Of what is radium believed to be formed? (Page 226).
6. Why might life on our globe be impossible for a visitor from another planet? (Page 208).
7. What are the qualities of the Heaviside layer? (Page 210).
8. What are the characteristics of the moon's surface? (Page 214).
9. What is the essential peculiarity about organic matter? (Page 231).
10. What chemical changes does lightning cause in the air? (Page 240).
11. How can the sensation or condition of gravity be produced in "weightless space?" (Page 264).
12. What means of propulsion could a man have travelling alone in free space? (Page 270).
13. How would a "space suit" have to be constructed? (Page 269).
14. What is the effect on us of an accelerated motion of our bodies? (Page 270).

The Feminine Metamorphosis

(*Continued from page* 263)

happened. For thousands of years, over in China, they have had a deadly disease. They have had it so long that by this time practically the entire nation has it without knowing it or without having many signs of it. They have just become accustomed to it, so that it is a very mild disease—but, at the same time, it is all through their bodies. Once in a while a white man contracts that disease, and then he dies a rather unpleasant death in a few years. Most of them become insane before they die. Now, when you girls operated on those poor Chinks for so many pieces of gold, you were operating on men who had that disease. Every ampule of medicine you prepared from their glands had the germs of that disease in it. You took five thousand of your smartest women, the ones you were counting on to lead in this feminine revolt, and you injected this disease into their blood. You gave them what you called male characteristics, but you gave them something else. You infected every one of them with this disease. Dr. Hamilton flirted with this idea—she even went so far as to test each Chink with a Wasserman test, but she did not know that the disease was so mild in the yellow people that it does not show a Wasserman. So, she lost sight of the danger. Of course, she realizes it now. She is not a specialist in mental diseases, but she sees now that your comrades who are going insane have *paresis*. I suspected all this—I have talked about all this to the specialists—and tonight I find, by your own statements, that I am right. Ladies, the harvest you planted ten years ago is just beginning. Inside of another year everyone of your brilliant five thousand financial leaders will be insane. Your movement will fail because there will be no brains left to carry the gospel of what you call feminine supremacy to the nation.

"One of the great men I talked to a few nights ago said that you had performed a feminine metamorphosis. He told me that meant changing a woman into a man. You did better than that. You took five thousand of our best women, girls who would have made loving wives and wonderful mothers if they had been well advised—you took the best that we have bred, and, through your desires to rule, you have changed them into five thousand insane women.

"There is no need of Johnson's trying to fight you. There is no need of his ever knowing what happened. I am ashamed to tell him—ashamed to tell anyone, because you belong to the same sex that my mother and wife and daughters belong to. I did not think women could be so—peculiar. I really thought women liked us men—my women folks are wild about me—you ought to see the neckties my wife selects for me and the scarf-pin. I am not going to say a word about this to anyone. I will just tell Johnson that he need not worry—and my advice is to give those poor girls some of the new arsenic preparations that sometimes works so well in these mental cases. Now, I am going to take my chorus girl and leave, and please be sensible and do not try to stop us, because, if you do, there are going to be a lot of us get hurt, and you, poor fools, are hurt bad enough as it is, if you believe what I tell you, and I guess you do—you look as if you did. You need not worry about Lucy. I will send her back just as soon as I am safe."

So, Taine and Flossie Ruffles walked out of the room and out of the Club, and out into the realities of little old New York.

That same night Taine called on Johnson.

"You owe me," he said to that worthy, "twenty-seven thousand dollars expense money. That is in addition to the money you had to pay those college professors. Me—you don't owe me anything except this expense money. I have your million and that is enough. The work is done. It was being done before I started. You need not worry about those people at the Bridge Club. In another year there won't be one of them that will know the minimum requirements for the dealer to bid one club. You can just take my word for it that they are through. But, at the same time, don't gamble on the stock exchange for a week or two, because they may try to get you."

Johnson looked at the little man in amazement.

"I suppose," he said, "that you will give me a full report?"

"No," replied Taine. "No use. You would not believe me if I did."

THE END

Science News of the Month

ASTRONOMY—METEOROLOGY

CANNOT TAMPER WITH UNIVERSE

That the Creator introduced some "fool-proof" features into his universe and thereby prevents us from attaining the secret of the energy in matter, is the conclusion of Professor Millikan, according to an editorial in the New York *Times*. Professor Millikan attained fame when he announced the presence of some rays coming from space, that he called Cosmic rays, and which were able to penetrate several hundred feet of water in mountain lakes. The nature of these rays as well as their origin is unknown. They are far more powerful than X-Rays. In these rays lies a great part of the secret of cosmic energy. In order to get the great amounts of power necessary to achieve a Utopia we must be able to build up atoms, not disintegrate them, according to Professor Millikan. And doing this on earth is impossible.

NEW UNIVERSES DISCOVERED BY POWERFUL TELESCOPES

The use in recent years of powerful telescopes such as the 100-inch at Mt. Wilson Observatory has located new universes of stars and cleared our ideas somewhat as to the constitution of space, according to *Science News-Letter*. With the discovery of *galactons* by Professor Shapley of the Harvard Observatory, the arrangement of stars into systems has been verified. Stars are grouped into clusters and clusters into larger groups called *galactons* of which many million exist. *Galactons* are grouped into *super-galactons* called *cosmons*. Nearly fifty separate *cosmons* have revealed themselves. The nearest one is eleven million light years away, and contains 250 separate *galactons*. Our own *galacton*, the Milky Way, has a diameter of 200,000 light years, our own little earth being 50,000 light years away from the center. It is believed that our own *galacton* is one of the best and finest in the sky. From the researches made of our universe it is believed now that it has a circumference of 120,000,000,000 light years. In other words, if light travelling at 186,000 miles per second were to start from one point of our cosmos it would take half a million million years for it to return. With our new 200-inch telescope it will be possible for us to see 500,000,000 light years away or about one-thousandth of the way through the universe. This is a pretty small part, but it compares favorably with our ability of only a few years ago.

EINSTEIN SAYS SUNSPOTS SUPPORT THEORY

The data found by the recent eclipse of the sun, as observed in Sumatra, has added to other tests a confirmation of his theory of relativity, declared Albert Einstein. The deviation from their normal path of the light beams from stars has confirmed his belief that a magnetic field such as presented by the sun has the power to bend light rays. Einstein's belief, as explained by Professor H. H. Sheldon of New York University, was that light has mass and as such is affected by gravitation, and, as Einstein said, gravity and magnetism are the same. Therefore, if that is true, a light beam passing near a large mass should be drawn toward it. Such a large mass which could provide a test is the sun. Only during an eclipse when the brilliant disc of the sun is blotted out, can the stars be seen and photographed at the same time as the position of the sun is seen. The positions of the stars are recorded as they would be if they were on a straight line with the direction of the light beam that finally reaches us. But we know where these stars really are from their computed position. If there is any difference between the position as computed and that as seen during an eclipse then the light beams must have shifted. Such was the fact during the recent test.

WEATHER PREDICTIONS FOR FUTURE MONTHS

It may be possible, soon, to make predictions of weather weeks or months in advance, according to meteorologists of the American Geographical Union. The observed fluctuations of the sun's heat and light, they believe, are the things responsible for weather changes. The solar radiant energy is being carefully studied at three astrophysical laboratories. The demand for better and better weather service brought about principally by aviation has caused the need for more intensive study of weather-making factors. The farmer, the mariner and many commercial enterprises also need a more accurate and more reliable service.

NEW STUDIES MAY ILLUMINATE NATURE OF UNIVERSE

Recent studies of the heavens with the spectroscope have determined the velocities of certain stellar bodies. One nebula has been found to be moving away from us at the rate of 2,400 miles a second, making it the fastest moving "object" in the world. By checking up the velocities of stars and their distances from us, it has been found that the further they are away the faster they are moving away from us. This relationship is puzzling to astronomers so far, but many theories are being built to try to decide what the structure of the universe must be like. The "curvature" of space as advanced by Einstein is already well known. And the belief that the universe itself is shaped somewhat like the earth "finite but unbounded" is also requiring acceptance.

(The relationship between velocity and the distance from us might be explained by the old-fashioned belief that we are really near the center of the universe. Further, that the stellar bodies are moving by virtue of centrifugal force—the further they are from the center the greater the force would be and the greater the velocity.—*Editor*).

AVIATION

FOUR DAY SERVICE TO HAWAII NOW

Air mail, freight and passenger service between San Francisco and Honolulu on a thirty-six hour schedule is the plan of the Goodyear-Zeppelin Company. With New York now only 32 hours away from San Francisco, the company officials expect that a 36-hour service from the West Coast to Honolulu will put Hawaii within four days travel to New York. The company is at work on two lighter-than-air ships with which they expect to inaugurate the service. These ships are being constructed simultaneously with two gigantic navy dirigibles at Akron, Ohio. Akron, it is expected, may be the eastern terminus of the air line. The first ship will be launched in the spring of 1931, to be followed 14 months later by the second. The dirigibles will be almost twice the size of the Graf Zeppelin, having therefore a capacity of about 7,000,000 cubic feet. They will be filled with helium instead of hydrogen. The United States has already enough helium to fill our airship needs, and in fact our supply of it will make us the world center to fill the needs of the rest of the world. The company is negotiating for a contract to carry government mail across the Pacific. If the line proves successful it might be extended to the Orient and Australia. Thus with the English air lines that have been established to India, travel across three-quarters of the globe by air will be possible.

PLANE TO MEET SHIPS 250 MILES AT SEA

A ship-to-shore plane service will be established shortly by the United States Lines, Inc., which operates the *Leviathan*. The plane would meet the ship 250 miles at sea, swoop down and pick up mail without stopping. By this method a whole day is expected to be cut from trans-atlantic mail time. Further, a plane can leave the Newark airport, which will be the eastern base, and carry mail to the ship fifteen hours after it has sailed from New York. With a ship like the *Leviathan* 250 miles out, the plane travelling at 150 miles an hour would pick up mail from the ship, and return to its base all within four hours. A huge Burnelli plane, one of the largest built in this country, will be used to inaugurate the service and will have a cruising radius of 4,000 miles. It is also believed that the plane will deliver and take off passengers from the ships, thus allowing the late arrival to catch the ship long after it has sailed.

RADIO SKY ROAD FOR AVIATION

The construction of a road in the sky for aircraft by means of radio is the plan on which aeronautical and electrical engineers are working. In the recent war games, radio, informing a bomber of his position and the weather ahead at all times, proved its worth. The army bomber used non-directional radio. But what the engineers hope to do is to build directional beams in the sky by which an aviator can tell at all times whether he is on the right path. Directional beams have failed in the past because they had a tendency to dip into the ground when they approached ore deposits. Recently, however, two National Air Transport pilots flew "blind" with the aid of directional beams. One of the pilots travelling from the Cleveland Airport to Hadley Field, N. J., landed at Bellefonte, Pa., where he was informed that the weather was almost impossible to see through. The pilot, however, went on through the fog, where beacon lights were hidden and he was guided only by the radio beam broadcast by the Department of Commerce. The pilot concentrated only on the dots and dashes coming from the receivers clamped to his ears.

BIOLOGY

SEX AND HEREDITY CONTROLLED, SAY SCIENTISTS

Experiments that resulted in the control of sex and natural characteristics in various animal life were described by the Genetics Department of the Carnegie Institution. The sex of water fleas was regulated by an experiment of Dr A. M. Banta. In laboratory tests paralleling the natural conditions under which the fleas germinate, Dr. Banta produced 840 generations all female. Then by his method he produced males by placing the fleas under a bottle in crowded conditions. The crowding, he believes, causes the production of males. Dr Oscar Riddle explained the control of sex in doves by overworking their reproductive facilities in taking away eggs as fast as they were laid. By doing this he believes he can produce females only. He believes, also, that sex can be founded on metabolic differences, such as controlling the rate of oxygen consumption.

One of the remarkable things described by Dr. Riddle was the case of a woman in England who developed a mustache and beard and many other characteristics of the male. She was operated on for a tumor and then the feminine characteristics were restored. The article describing this appeared in the current issue of the *Journal of the American Medical Association*. Dr. Riddle concluded from this that the secretions of the ductless glands may change sex, for it was the tumor that made the glands function abnormally.

INTELLIGENCE ONLY ON EARTH

From our experience with interplanetary communication, or rather lack of it, Hiram Maxim, noted inventor, concludes that our planet is the only one that contains intelligent life. "We have received nearly every frequency of the spectrum," he said, "from the lowest radiation to the highest, which is known as the Millikan Cosmic Ray. Is it not odd that of all these radiations from inter-stellar space there is not a scintilla of evidence that any of these radiations were sent out by intelligent beings? So may we not judge from that, that on this little earth of ours resides all the intelligence of the cosmos?"

(Mr. Maxim's reasoning seems faulty. Deaf and dumb mutes would not conclude convincingly that there's no form of speech. By the laws of probability it would seem very strange that of the millions of worlds of our cosmos our little insignificant earth alone has sentient beings.—*Editor*).

SURGICALLY MADE GENIUSES NECESSARY

That the human race must evolve constantly higher and higher types or suffer the retrogression of all backward species is the belief of Dr Clarence G. Campbell, president of the Eugenics Research Association. Although man may not go the full backward path of the sabre-toothed tiger, still there lurk for him in the future tests that he can meet only by producing higher types. The genius so far is an accident, a combination of brain neurons making new ideas and new thoughts possible. But the genius dies and with him dies also precious neurons. By eugenically mating people of superior power the neurons would be saved and possibly a higher species or greater genius might result. There are two kinds of eugenics, the negative which prevents the reproduction of the mentally defective, and the positive which aims at the mating of the mental superior. Birth control clinics are advocated in greater numbers so they can allow those who have the greatest tendency to multiply—usually those who offer the least in brains and creative ability to the world—to limit their offspring.

CHEMISTRY

RADIO-ACTIVITY NOT DUE TO COSMIC RAYS

In an attempt to discover whether the radio-activity of radium and related elements was caused by the cosmic rays that are supposed to come to us from space, Dr. Louis B. Maxwell, National Research Fellow at the Franklin Institute, took some polonium into a mine 1150 feet below the surface of the ground. His theory was that inasmuch as cosmic rays had the power of penetrating several hundred feet of water and corresponding amounts of other materials he must get beyond their range. In the mine the amount of radio-activity was measured and the activity of a corresponding amount was measured at the surface. The activity of both specimens was found to be the same, demonstrating that the activity is not due to the cosmic rays.

STERILIZING WATER

A process for sterilizing water, called the Katadyn is announced from Berlin as the invention of Dr. Georg Krause, a Munich, Germany, engineer. Metal silver in scales so tiny as to appear to be a mere film is inserted in a container which is put into a special earthenware water jug. When left there for several hours the water is completely sterilized, remaining so for several months. The silver, acting as a catalyzer, destroys the germs without itself being affected. The use of silver was determined upon as the strongest germicide of all the heavy metals, being at the same time absolutely harmless. By use of the Katadyn, Dr. Krause hopes to provide a means for those in out of the way corners of the earth, where pure water is unavailable, to sterilize their own.

NO TRANSMUTATION FOUND IN EXPERIMENT

The results of experiments to determine the possibility of transmutations of elements were carried out recently by L. Thomassen at the suggestion of Professor Millikan. The results published in *The Physical Review* showed no transmutation whatever, and at low energies it is deemed most unlikely to occur. An X-Ray tube was used in the experiment and the metal used as a target was bombarded with electrons. The tube was operated at a peak voltage of 207,000 volts. The method used was declared to be excellent and should have shown transmutation had there been a tendency for it to occur. The experimenter also repeated the work of Professor Smits who claimed to have changed lead into mercury, but the results were negative. It is concluded that much higher energies than those now attained must be used on the heavier metals.

"Science News of the Month"

portrays in plain yet concise language every important scientific advance during the month. Nowhere can the average reader get such a wealth of accurate and vital information condensed into such a small volume. Some 42 scientific journals as well as a score of other sources are utilized by our editors in the compilation of this department. The publishers welcome short contributions to these pages from the various scientific institutions, laboratories, etc.

CHEMISTS TELL HOW MOLECULES ARE MEASURED

The methods of determining the measurement of molecules and the patterns that atoms form in a substance were the subject of a symposium of the American Chemical Society. The method discovered by Irving Langmuir of forming a film of benzine on water, so that the film was only one molecule deep, was mentioned. By this method the number of molecules per volume was found and therefore the size of each one. The beautiful blue tone of ultramarine has been traced to a wandering sulphur atom, going its errant way through lapis lazuli. The greatest study toward the recognition of characteristic elements is by the spectrum.

"AUTOMATIC CHEMIST" TESTS CITIES' WATER

A device which automatically tests and safeguards the purity of water used by large cities was displayed before authorities of a number of cities recently. The "automatic chemist" consists of a small portable metal box containing the tubes and wires and equipment necessary. This device regulates the chlorinating process that is used to purify city waters. It increases or reduces the amount of chlorine necessary, as the condition of the water changes. After a storm or flood when polluted streams infect the main water supply, enough chlorine is released automatically to forestall any chance of disease. It has been physically impossible for a city chemist to test water every minute of the day but now this device does it.

CHEMISTS MAKE SYNTHETIC SCENTS

Since everything else is becoming synthetic, the development of synthetic scents seems somewhat inevitable according to an article in *Science News-Letter*. This is especially true when one considers that the male deer which carries the perfume pod or scent gland is being killed off at the rate of 50,000 to 100,000 every year and is becoming relatively scarce. The scent made synthetically was demonstrated by Professor Ruzicka of Columbia University and is known commercially as *Exaltone* whereas its chemical name is cyclopentadecanone. It sells for $275 an ounce. The natural musk which sells for $35 an ounce is only 1 percent pure, thus illustrating that the synthetic product is about one-tenth as cheap as the natural.

CONFESSIONS BY DRUGS BANNED

The result of a recent case in Hawaii where a boy under the influence of a drug confessed to a murder he had never committed, probably will spell the doom of the use of such drugs, says Doctor Morris Fishbein in the *Scientific American*. The drug was *scopolamin* and its purpose was the inhibiting of the will of the criminal so that under the influence of it he would invariably answer questions truthfully. In the Hawaiian case a Japanese chauffeur was arrested for the murder of a boy and he maintained his innocence until the drug was applied, when he "confessed." When the drug had worn off he repudiated it. It was discovered later that he had no connection with the crime. The use of such tricks anyway, says Dr. Fishbein, is contrary to the Anglo-Saxon system of jurisprudence.

SPECIAL EDUCATION FOR SUPER-MINDS

In an effort to procure special education for super-minds, to develop great leaders in chemistry, nine young men have been picked to study at Johns Hopkins University where they will work under Professor Neil Gordon, who holds the chair of chemical education at the University. The plan provides for the concentration of genius in chemistry for, as Professor Gordon said, it is the super-intelligent men who have given us our progress. If the world had to depend for its progress on the mentality of the lower 90 per cent of the people, it would remain just where it is, in *status quo*. He deplores the fact that too much of our educational activities are directed toward the average. With the growing complexity of problems, there is coming a greater and greater need for master minds. The young men will be allowed to do research work under a fund established by the Gerwen Chemical Foundation.

GEOLOGY

EARTH'S INTERIOR STILL MYSTERY SAYS ASTRONOMER

Replying to a question why astronomers did not know more about our neighboring planets, Abbé Moreux, director of the Observatory at Bourges declared that at our present state of knowledge we know very little about our own earth, at least about its interior. So far we have penetrated only about 2.5 kilometers (1.7 miles), this being at Ollada, California, where rocks were brought to the surface. But as compared with the radius of the earth, some 6,000 miles, what we have done so far is merely a scratch. In fact, the Abbé says, our knowledge of the surface of the globe is not exact.

1,000,000,000 TONS SOIL ERODED BY FLOODS

We are becoming used to hearing about the flooding of villages, towns and farms by our untamed rivers. That the floods are destroying soil and plant food in the soil worth several billions is the statement of Hugh H. Bennett of the U. S. Department of Agriculture as stated in the New York *Herald Tribune*. Seventeen million acres of arable ground are destroyed for cultivation each year, he says, and the washing away of the top soil which contains the valuable plant foods utterly ruins the ground for further use. Mr. Hammond believes that the problem of the control of these floods is a serious national matter.

ATLANTIC SEABOARD NOT SINKING

Recent studies by the Department of Geology of Columbia University together with the National Research Council and the United States Geodetic Survey have disproved the contention made that the Atlantic seaboard is slipping into the ocean at the rate of a foot or two a century. Investigations made in New York waters showed that apparent changes in the relative levels of land and sea may be deceptive. A supposed subsidence of the coast may [illegible] a local variation in the sea level due to some change in the form of the coast caused by waves and currents.

MEDICINE

SUN'S MEDICINAL POWER NO DIFFERENT IN WINTER

The belief that the sun's rays during the winter do not contain the same beneficial elements as in summer is erroneous, declared Dr. Arthur R. Riddle of the Hegeman Laboratory of the Metropolitan Life Insurance Company. There is no difference in the seasonal constitution of the sun's rays, the observable effect in the curative value of the rays is due only to the intensity. Naturally they are stronger in Summer than in Winter and the effect on one being treated by them would increase from Winter to Summer.

WORLD'S NEED FOR RADIUM EXCEEDS SUPPLY

The subscription of $1,500,000 in Britain recently to purchase a supply of radium for the nation served to call attention to the scarcity of the material and the total inability of the producers to supply the demand. There exists in the world now only 250 to 350 grams or one-half to three-quarters of a pound of the precious substance. However, inasmuch as it loses only half its volume in 2,500 years from its radio-activity the supply will have quite a long life. The greatest supply in the world is in the Memorial Hospital of New York where there is now eight grams valued at about a half million dollars. Ninety per cent of the material is handled through Belgium, and in fact most of that which is now produced comes from the *pitchblende* of the Belgian Congo.

CAT LIVES HOURS WITH RUBBER HEART

A cat lived for several hours with a rubber heart pumping blood through its system according to Dr. O. S. Gibbs of Dalhousie University. The heart was electrically operated, and the cat continued to exist, even though the natural heart had been removed. The natural heart had been worn out by experiments to determine the effect of drugs on the system. The operation, the removal of the natural heart and the substitution of the artificial one took about five minutes altogether.

BRILLIANT MEDICAL RESEARCH REPORED PELLAGRA

With the awarding of a Congressional pension to the widow of Dr. Joseph Goldberger, the results of his years of study of the disease *pellagra* have come to light, and revealed a brilliant scientific accomplishment. When Dr. Goldberger started the study of the disease very little was known except that its victims showed skin rashes, contracted mental aberrations and usually died in the insane asylum. By an intensive study at first hand of *pellagra* victims and their environment, by experiment after experiment, Dr. Goldberger eliminated the theory that it might be a contagion spread by germs and finally hit on the conclusion that it was caused by a deficiency of certain substances in the diet. He tried this out by isolating two groups of volunteers, and giving them different diets. One group contracted the disease and the other did not. He found and isolated similar disease among dogs called "black-tongue." He finally began to feed pellagra victims yeast and they recovered. Now his successors are going on with the study of this disease which strikes upon the poor and undernourished, and they will have a brilliant foundation upon which to complete Dr. Goldberger's work.

TUBERCULOSIS DETECTOR DISCOVERED

Two methods for the detection of tuberculosis during its early stages were revealed during the annual meeting of the National Tuberculosis Association. Dr. Esmond R. Long and Florence B. Seibert of the University of Chicago announce that they have been able to produce *tuberculin* in a pure state and by means of it can detect the white plague very early. It is to be used extensively in detecting the disease in fowl and cattle, and to attempt to discover what effect the disease in those animals has on humans. *Tuberculin*, heretofore, had only been procured in an impure state and this led frequently to diagnosing cases as tubercular which later were shown to be free of the disease. Three doctors of the Rockefeller Institute, Florence R. Sabin, C. A. Doan and C. E. Palmer, have devised a means of detecting the disease within three or four days after the infection; before any serious damage is done by it. What the instrument was, was not divulged.

PHYSICS

TEMPERATURE OF 458 DEGREES BELOW ZERO REACHED

Professor W. H. Keesom of the Leyden University, Holland, who succeeded in solidifying helium, a task considered extremely difficult, has now been able to reach a temperature of 458.58 degrees below zero, or .82 of a degree above what physicists consider absolute zero. He has achieved this in a small volume equal to 12 cubic inches, which is large enough to allow placing in it the instruments necessary for experimentation. Previously, the largest space that had been reduced to such a low temperature was one cubic centimeter. In so much as absolute zero is considered the temperature at which all atomic activity ceases, much valuable information about the structure and character of matter is expected from Professor Keesom's [illegible].

FLY-WING MEASURES STARS' RADIATION

Part of the wing of a fly hung on a thread upon from a rock is used to measure the radiation from stars millions of miles away, says *Science News-Letter*. Dr. Charles G. Abbot of the Smithsonian Institution described the method of doing this. The apparatus which used the fly-wing is built on the principle of the radiometer—the apparatus often seen in the windows of opticians. In the latter device, little vanes are rotated by the heat of the sun falling on blackened surfaces and the heat waves rebounding, thereby creating a reaction to rotate the vanes. On the fly-wing apparatus the cause is done only the radiation of light from the stars strikes on the fly wings. Three little wings were used to form a T-shaped figure. Another figure was hung opposite it with a space of 1/250 of an inch between them. They were suspended from threads of quartz. One side was blackened and the movement of the wings due to the light impact was measured. Thus the light received from distant stars has been analyzed.

DEVICE MEASURING EMOTIONS INVENTED

Professor R. S. David, of Columbia University has invented a device to measure the emotions of a human being. It is called the *Psycho-Galvanic Reflex*. The equipment consists of a mass of electrical apparatus ending in a radio receiving set. The operator sits beside the set, with the subject in the next room. The subject is sitting in the dark with the fingers of one hand immersed in a brine solution. This serves as a conductor for a mild electric current through the body. The master of ceremonies comes into the dark room and asks the subject a question concerning some emotional subject. The reaction of the subject is measured by the operator in the next room. He can also measure the reaction to various sounds and smells. The reactions of the subject are also photographed by the instrument so they can be studied at leisure.

MICHELSON TESTS VELOCITY OF LIGHT

An attempt to check the velocity of light, the discovery of which was partly due to his ingenuity, is the task the 76-year-old Professor A. A. Michelson has set for himself. A tunnel a mile long will be used. In it will be an almost perfect vacuum with temperature conditions set perfectly right. In as much as the calculation of the speed of light 186,000 miles per second is that in a vacuum, Professor Michelson wishes to verify it. The light will take a ten-mile path, being reflected back through the tunnel five times by mirrors. If he achieves a correction of 1 to 2 parts in a million, then he will be satisfied, declared Michelson.

SELF-PHOTOGRAPH INVENTED

An instrument called the *photo reflex*, whereby one can take a photograph of himself from any desired angle and with any pose has been invented by Luther G. Simjian, director of the photographic division of the Yale Medical School. The subject seats himself in a cabinet five feet wide and nine feet long. Mirrors surround him on every side. He sees in front of him on a small plate a picture of how his photograph will look. He can then arrange his pose to suit himself and when he is satisfied with what the reproduction will look like he presses a button with hand or foot and the picture is taken. The lights in the cabinet are extinguished and the exposed film is automatically displaced by a fresh negative. The lights are switched on for the next exposure.

RADIO-TELEVISION

TELEVISION MOVIES TO BE BROADCAST

A series of short motion pictures will be broadcast in the near future by the Visugraphic Pictures, Inc., to those possessing television receivers. The pictures will be broadcast from station W2XCR, Jersey City, N. J., which is owned and operated by the Jenkins Television Corporation.

TELEVISION AND RADIO BY ULTRA-VIOLET DEMONSTRATED

A demonstration of television and radio by means of ultra-violet rays was made by the United States Radio and Television Corporation. Paul A. Kober, who designed the apparatus, had the transmitter with a mercury induction lamp set up. A filter was attached which allowed only the ultra-violet rays to pass through. Seventy feet away was the receiver, a television screen. People standing in front of the transmitter were seen by those looking at the receiver. Further, when voices were used at the transmitter, they were heard at the receiver. The light beams, of course, are invisible, having a vibration rate of 767,730,000 million cycles a second and a wave-length of 390 millimicrons. When objects stood between the transmitter and receiver, during the demonstration, the beam was intercepted and nothing was received at the receiver. Use of the ultra-violet will make a new radio channel, and one which will be open only to those using his apparatus.

DIRECT NEW YORK-SAN FRANCISCO RADIO SERVICE BEGUN

Radio service between New York and San Francisco without the use of a relay was begun recently by the R.C.A. Communications, Inc., by the exchange of messages between Mayor Walker of New York and Mayor Ralph of San Francisco. Using a short-wave circuit, a speed of transmission of 250 to 300 words a minute is possible. The new service includes photo-radio transmission as well as messages, and is the first step in the establishment of a national short-wave system. An improved beam projector system is used, this being the development of engineers of the R.C.A., resulting from several years of experiments.

RAY STOPS MOTOR VEHICLES

A. Roberts, who claims to be the inventor of a "death ray" recently demonstrated, says, *Modern Mechanics*, has an apparatus by which he projected a ray that stopped a motorcycle. The apparatus weighing less than fifty pounds, is held in the hand and pointed at the vehicle. Electricity is its basis, it is said, but the inventor refuses to give more definite information about its manner of operation. Roberts claims that the "death-ray" demonstrated by H. Grindell Matthews and given much publicity, is really his invention.

TELEVISION SPEED REQUIREMENT CAUSES DIFFICULTY

The necessity for the transmission of images at 100 times the speed necessary to send still pictures or "photos" to form moving pictures is causing most of the difficulty in the promotion of the art, Dr. Alfred N. Goldsmith of the Radio Corporation of America told the Institute of Radio Engineers. The problem of the speed requirement has introduced serious difficulties, and has caused what Dr. Goldsmith termed the "leisurely development" of television compared with the rapid progress of telephony or telegraphy. L. W. Horton of the General Radio Company stated, however, that the scientific problems accompanying photo radio and television were solved years ago but it is the economic problem that is difficult.

MEASURE MOISTURE BY RADIO

A method of measuring moisture by radio, was described by the inventor, Professor E. F. Burton of the Department of Physics, University of Toronto before the Royal Canadian Institute. The device is an application of an ordinary high frequency alternating current obtained by the use of a radio tube.

SHIP-TO-SHORE TELEPHONE SERVICE TO COME

Experimental work on radio telephony to be used between ships and sea and a ship and shore, is in progress, says Sosthenes Behn, president of the International Standard Electric Corporation. Short-wave wireless telephone equipment is being installed on a transatlantic liner which, according to Mr. Behn, will receive the severest tests. Commercial service will probably result from the success of the experiments. Wireless telephone stations have been established by the International Telephone and Telegraph Company at Buenos Aires and Santiago for communication with the United States and Europe.

RADIO COMMUNICATION WITH MARS IMPROBABLE

Because of the "skip distances" of radio signals below 100 meters it is rather improbable that we can send messages to Mars, said Dr. E. O. Hurlburt of the Naval Research Laboratories before the Institute of Radio Engineers. Waves longer than 100 meters will not pierce through the atmosphere, anyway. And the shortest wave possible for reliable long distance communication is 47 meters. On a summer day the skip distances for 100, 66, 60 and 50 meters would be 0, 790,1410 and 2240 kilometers respectively. From these calculations, he deduces that only a very optimistic experimenter would expect from our present equipment any communication with Mars.

GENERAL

TYPE SET BY HUMAN VOICE IN NEW MACHINE

A machine has been developed by the Polygraphic Corporation of New York whereby a reporter may read his story into the machine and the type will thereby be set. This will eliminate all necessity for a human typesetter. The copy to be set is merely spelled out, and the sound impressions are recorded on a moving film. In some way, not described, the film causes the particular letters or symbols to be picked out of the font. Changes in font can also be made as often as required by merely indicating the change vocally. The Ediphone or Dictaphone can also be used with the machine to give the actual instructions to the machine.

BEES STUDIED FOR LIFE-PROLONGING ELEMENTS

Dr. Frederick G. Banting, Nobel Prize Winner of 1923, and Professor H. F. Jackson are starting a study of bees to determine what elements in their lives may divulge some life-prolonging principle, declares *Tit-Bits* of London. It has long been known that the Queen bee has a life cycle far longer than that of the ordinary workers. It is known also that the Queen's food is different from that of the workers. What the scientists hope to discover is that the jelly used as food by the Queen may contain the substance that will prolong life. If that is true, there will remain a second study to determine how the jelly may be made synthetically to provide sufficient quantities to supply the human race. The Queen's life is three times that of the drone, and from five to fifteen times that of the worker. In addition the Queen is twice the size of the worker and a third larger than the drone.

(Dr. Keller's story in this issue, "The Bonehoe Horrors," contains much about this very interesting question.—*Editor*).

GARRETT P. SERVISS DIES

Garret P. Serviss, well-known to readers of science fiction and those interested in science generally, died in the Englewood, New Jersey, Hospital at the age of 79. He was a lawyer and an editorial writer for the New York *Sun* at various times, but his absorbing interest was the popularizing of science. This he did in a fashion which made his name known to millions. He wrote and lectured on astronomy and history and travel. In 1896, at the risk of his life, he climbed the treacherous Matterhorn. Among his books were "Astronomy with an Opera Glass," "The Conquest of Mars," "The Moon Metal," "Pleasures of the Telescope," "Other Worlds," "Curiosities of the Sky," "A Columbus of Space," "The Second Deluge," and "The Moon Maiden." He is survived by his widow, a son and daughter.

EDISON SEARCHES FOR NEW INVENTOR GENIUS

The announced intention of Thomas A. Edison to discover among high school boys a possible inventor genius has aroused much interest from scientists, educators and psychologists. Edison plans to take the most promising young man from each state, give them all a special test of his own to determine the most capable. The one selected will be given a university scholarship to fit him for the fame that is sure to be his. The consensus of opinion of authorities as announced in *Science News-Letter* seems to be that the tests given would have to be more severe than the questionnaire that Edison proposes. There must be severe intelligence, scientific aptitude concentration, abstract thinking and a great number of bewildering mental tests that psychologists have devised.

NEW ROBOT MONEY-CHANGER REJECTS SPURIOUS COINS

New Yorkers are becoming used to the robots in the drug stores who change their coins into others and who sell them cigarettes and chewing gum. The Consolidated Automatic Merchandising Corporation, which owns the robots, has had quite a bit of difficulty with bad coins. Now the robot rejects them coins and in what is described as an "assiduous voice" says, "Please use good coins only." Canon, as he is known, is stationed in the Liggett store at Broadway and Forty-second Street, New York. He is said to have the power to analyze the metal content of each coin presented to him and to weigh the coin with his delicate machinery.

MODERN WONDERS HAVE LONG BACKGROUND

It would be a mistake, says Dr. Robert A. Millikan, in the *Nation's Business*, to consider that our modern wonders, the airplane, the radio, etc., are products solely of our own time. For the airplane was made possible by the internal combustion engine, which grew from the old steam engine, which in itself was made possible by 200 years of work in celestial mechanics. The radio, too, springs from 20 years of research with electronic discharges in high vacuums. Our own epoch is but a minute in the vastness of the world's age. We are figuratively fretting from our cribs and wondering what sort of an external world we have. And for the billion years or so that we may still inhabit the earth, the kind of world we will have will be our supreme concern. Man is learning the possibilities ahead of him so that during the next billion years he may learn to live a million times more wisely than now. (Dr. Millikan's statement of our concern about the world of the future, is also the concern and subject of much of so much of the material in SCIENCE WONDER STORIES.—*Editor*)

What Science Fiction Means To Me

WHEN the publication of SCIENCE WONDER STORIES was first contemplated, the editor of this publication addressed a number of letters to science fiction lovers. The editor promised to pay $50.00 for the best letter each month on the subject of "What Science Fiction Means To Me." This contest was to run for three months. The last prize winning letters, therefore, appear in this number.

The response to the request was so great, and such a large number of most excellent letters were received, that it is only possible to print a few of the best ones. We are sorry we are not able to publish more of them. The editor admits that as usual he was hard pressed to award the first prize, but we hope our readers will agree on the selection.

The remarkable letters printed here show in what esteem science fiction is held by our readers and authors.

First Prize $50.00

The Story of Humanity

Science fiction to me is the answer to the cry of the ages for relief from the everyday grind; it is the key to the door of a magic land where nothing is drab and dreary, and all is new and strange and fascinating. It is a magic carpet that will take us to far-distant planets through strange and wonderful cities and civilizations, fling us centuries into the future to the pinnacle of the culture that is to be, or send us through the curtain of the past, to view with astonishment the primitive men, gigantic animals and reptiles and forgotten vegetation and stars and sun of a day that is no more.

It is the unfolding of a drama of a superb struggle of the human being to lift himself higher and higher and farther and farther from the slime of the primordial, it is the tale of a mighty battle for knowledge, the eternal struggle for truth, and the tale of the hard-fought victory that man is winning against fanaticism, intolerance and ignorance.

It is the forerunner of the progress of science, and the ever-swelling additions to human knowledge that it is making, of the challenge of the man of science to the problems of nature that seemingly defy solution. It is the advance guard of the progress of the whole human race, finding one veil in its path, tearing that aside, only to find another, and rend it asunder also!

It is a tale of the efforts of primeval man boring upward and outward from the dark depths of ignorance to the ultimate goal, the white light of Eternal Truth.

It is a story of the far-flung mysteries of the stars, of the secrets of gigantic forces locked up in the unconquered atom, of the mastery of disease, of the lengthening of the span of life, and it is a symbol of the puzzle of life itself.

It is a story of Humanity!

P. P. Swigget, Jr.,
Las Vegas, New Mexico.

First Honorable Mention

The Perfect Entertainment

Science fiction means to me the perfect combination of entertainment and enlightenment. With irresistible smoothness, it combines these qualities to a greater degree than any other type of literature. The rapid increase in popularity of science stories is ample proof that they meet a demand which had gone too long unheeded.

I find the reading of these stories an easy and delightful way of keeping in constant touch with scientific progress. This method of learning is infinitely more pleasing than the tedious process of prying such information from textbooks. The absorption of knowledge becomes a real pleasure.

Science fiction is a marvelous aid to clear thinking. Problems are discussed from unusual angles. Technical terms are used sparingly. Such stories intensify my interest in science, and give new enchantment to its facts and theories.

Stories of science are the best example of "different" fiction, because they are based upon truth. My enjoyment of them is greatly increased when I realize that what now seems so strange and wonderful may soon day become reality.

The literature of science is the magic rug upon which my thoughts are instantly carried to queer and marvelous places. My imagination is given free rein, and seeks eagerly for things odd and startling. I meet quaint characters. I find new friends, and share with them the thrills and dangers of their extraordinary adventures. Science stories are indeed the realm of the bizarre and the unexpected.

Science fiction is the conqueror of time and space. It is the master key that unlocks the forbidden door of the future, and reveals the mystery of ages yet unborn. What changes will the next million years bring? What lies beyond the boundaries of our universe? What wonders are within the atom? What is the secret of the fourth dimension? What forms of creatures inhabit other planets? I find in science stories the most logical answer to these and hundreds of other questions. No other kind of fiction contains such limitless possibilities.

Science stories provide me with countless hours of fascinating reading. They match my every mood. Whether I seek mystery, romance or travel, science fiction quickly supplies stories that correspond with my desires. Worries and cares forgotten, I revel in thrilling and exciting events. These stories grip my attention and hold it. They are worth reading again and again.

J. Ray Chapman,
161 Loomis Ave., S. E.
Atlanta, Georgia.

Second Honorable Mention

Crosses the Chasm of Impossibility

Science fiction means that not only I, but hosts of others may revel in the glittering plausibilities advanced in the dynamic writings of alert giants in the field of letters; may find ourselves journeying mentally with them through the cosmic infinitude from the realm of sub-atomic division to the realm of horrendous magnification.

Moved by a vast curiosity we beseech the science fictionist to create new tools and adapt them to use. We delight in the warp of Romance woven into the cloth of Fancy.

We cross with him, the chasm of impossibility to explore the tarnered unknown, there to roam as pioneers in hitherto undreamed of planes of evolution.

Science fiction's tremendous appeal is thrilling. With equal facility it delves into, and lays bare universes within the proton; construes the Cosmos itself as a belated atom, isolated.

Its prophetic discernment makes matter-of-fact its processes of reasoning. The herculean strides of its mechanical genius portend the ultimate obsolescence of present-day standards of attainment.

Deep in its fabric of imaginary conquests are the nuclei of opportunity. All of the arts and sciences are but pliant mediums spread upon the palette of eventuality.

The parsec is science fiction's foot-rule; the refracting microscope its lamp of accomplishment; past, present and future are as one in its calculated deductions.

Inspirational and REAL are the soul-awakening demands it forces from our intelligence. We become more tolerant of the commonplace, and progress toward a larger, fuller comprehension of the mystery of all existence.

Science fictionist, all hail the thought!
Whose fleet wings lightly span the gulf of

[illegible]

Revealing mighty mysteries; Time-wrought;
And scales the heights none other dares to face.
A tragedy of life thou dost reheerse
Between the mystic spectrum's flashing bars,
And from a sub-atomic universe
Thy dauntless hands reach out, and grasp the stars.

Science fictionist, all hail to thee!
We contemplate thy works with bated breath.
Thy Cosmic playground is Infinity;
Thy toys: Time, Space, Creation, Life and Death.
Thy flashing lightnings strike the doubter cold;
Old canting dogmas 'neath thy thunders quail.
Dot! Dare! Defiance! in thy challenge hold.
Science Fictionist, to thee, all Hail!

Al. Browne,
San Francisco, California.

Brighter and More Intense Life

Here on the American continent is a great clamor—a clamor for things cultural. A hope gleams—a hope that a distinctive art, a distinctive literature may evolve. There are many forces contributing to the cause. Literature without science fiction is food, but not a feast, a flower without fragrance. Personally, I believe that my whole life will be brighter and more intense in every way for reading these tales of science fiction.

I am a student of the short story. My huge interest in your magazine is based upon the belief that anyone who wishes to be admirably entertained and pleased will do well to buy a copy of a science fiction magazine each month, for it contains perfect examples of accurately constructed stories, with simple, strong, well-formed and filled out plots that just teem and bustle with a healthy and wholesomely close action.

I have an opinion that some of the stories in science fiction would be out of place in a very limited collection of the world's best short stories. For bed-time reading I would advise for everyone a copy of your magazine—and drift off into the vast space to the other planets with new acquaintances. I strongly believe that your science fiction magazine is the best money's worth today and it will soon occupy a large space on the newsstand.

Nicholas Mistbrocky,
Ashville, Manitoba, Canada.

A New Language of Optimism

It means to me a chance to play around in imagination in many strange fields. Not the restricted city yard bordered by fences "pass not" but with unrestricted liberty to roam about in the arcane past or to identify myself with conditions that may obtain eons in the future, but always tied to sanity by the golden thread of science or its logical extensions.

It means to me a chance to measure ideas in a big way, not confined to mere pounds or pennies, but to grow out into the blue. The teaching is uplifting, this refreshing review of science in its many angled applications to interesting development. True, we know little, yet science is lifting veil after veil and we learn in accelerating ratios. We gain a steady faith in science and bright hopes for the days to

[redacted]

It means to me a new language of optimism. It is something to be one of a band of outlookers—seamers of far horizons—that are linked together with new and wider viewpoints. These say to each other, "We be of one blood, thou and I." We have learned to think in new terms and can see pictures that are more than pictures.

It means to me more confidence in thinking along constructive lines and I feel it is something I could not do without, except to my own loss, both in enjoyment and education.

James G. Walker,
Burlington, Vt.

In this department we shall publish every month your opinions. After all, this is your magazine and it is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinion. It makes no difference whether your letter is complimentary, critical, or whether it contains a good old-fashioned brick-bat. All are equally welcome.

All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large influx of mail, no communications to this department are answered individually unless 10c in stamps to cover time and postage is remitted.

In order to give our authors an opportunity to defend themselves from the criticisms of their stories, we are opening our columns to them. Inasmuch as the majority of the criticisms of the June issue were directed against "Warriors of Space," by James P. Marshall, and "The Marble Virgin," by Ronnie MacDonald, we have invited these authors to write their defense. The letters follow. This policy will be pursued in the future.

Mr. Marshall Speaks

Editor, Science Wonder Stories:

Indeed I am pleased to write a few words in this matter in defense of those space cars and their powers of destruction, even when directed against so large a body as Saturn.

In a way I would feel that I had failed miserably if the story did not in itself explain the power of these cars, for naturally the intelligent reader would object to miracles which are thrust upon him without any supporting framework of plausibility, and a story so written could not reflect any credit upon the author.

It was my intention and my hope to convince the reader as the young scientist in the story convinced the delegates, and I really feel that in support of the space cars I cannot do better than to emphasize some passages from the story itself:

"You must consider more than the power of one world, we are dealing with the universe. You must forget your present knowledge of mass and weight as they are known on earth. You have seen snakes delicately balance, with perhaps a large weight on either side. It takes but a fraction of an ounce to disturb that balance. The universe is like that, each member nicely balanced by opposing forces. We have but to strengthen one of these forces on one member and the balance of that member will be destroyed, making it move as the stronger force directs."

And again:

"The gravitational field of the planetary system *is* as great a source of energy that any one star has unlimited power at its command."

It must be remembered that the space cars in themselves had no power to *create* energy. They merely acted as mediums, as valves, through which the infinite power which holds the whole universe was liberated and directed, and that power so liberated and controlled had not to move a deadweight mass, but merely to unbalance a mass which depended entirely on the *nicety* of its balance to hold its place in the universe.

James P. Marshall

Mr. MacDonald Defends "The Marble Virgin"

Editor, Science Wonder Stories:

Replying to yours of the 10th instant, inquiring if I wished to answer the criticisms of my story, "The Marble Virgin." Yes—I do wish to make the points over which criticism has centered clear. The following is [illegible]:

It is stated, early in the narrative in chapter three, that Muxhold himself conceived the idea of causing metastasis, from marble into flesh, of the statue upon which Wallace Land was at work. Following this, Muxhold proceeded about more than a month's endeavor to fashion his terrible *Cabinet* and *Electron-dissolver*. His genius was capable of fashioning the apparatus, and he did. The fact that it was necessary, in order to change marble into live flesh, in order to change the statue into a living, breathing personality, is covered by Professor Muxhold himself—he built his *Cabinet* and *Electron-dissolver* for the one exact purpose for which it was used! His terrible machine could not at will cause transmutation of chosen substances into other elements; but his *Cabinet* and *Electron-dissolver* could change marble into flesh, could—through the superpower of the rays it generated—*cause metastasis of marble into organic flesh!* The building of cells, organs, nerves, bone, tissue, etc., such as every human body possesses, was within the power of Muxhold's *Cabinet and Electron-dissolver*, however!

Near the close of chapter four, Muxhold explains, "An atom was long believed to be the smallest particle of indivisible matter. Science then learned that atoms possess constituent parts, positively electrified 'protons', with negatively-electrified 'electrons' massed in a spinning, darting planetary-system about them." Muxhold goes on to acquaint Wallace Land with the fact that *it is the number of these electrons and protons alone that determine the element! Whether it was gold, iron, silver, a lump of potash—or live, organic flesh!* Muxhold then points out that opposing rays means could be discovered whereby electrons and protons might either be added or subtracted at will, any substance (including metastasis of marble into organic flesh) might be transformed, by this powerful means, into some other (chosen) substance!

Ergo, when Professor Muxhold manufactured his apparatus the strange *Cabinet* and *Electron-dissolver, he incorporated each and every separate foundation to the power of the rays it generated, that not only was the marble statue itself given a complete transubstantiation into live, organic flesh, but while this occurred the whole wonderful complement of all that a normal living body incorporates was also part of the strange metastasis!*

The refulgent phosphorescence shooting from the bore of Muxhold's *Electron-dissolver* to play over the statue standing in the curve of the *Cabinet*, was not *ONE* ray merely; it was literally thousands of vitally effective rays carefully calculated by Muxhold's mad genius to perform the task of transubstantiation! It did not occur at once, either; but over a good long period. It was not explained, in the story, quite as clearly as in this letter; but bear in mind that I was, after all, writing a *scientific story*—not a detailed treatise on metastasis, or transmutation of elements. In other words what I pictured as happening within a few minutes really took, or might take, hours, or days, or months—who knows!

I think this covers *every* point save another that may be raised, now that I have pointed out that Muxhold's *Cabinet* and his *Electron-dissolver* were created by Muxhold for the single task that lay in causing transubstantiation in the marble virgin. How come, it may be questioned, that Muxhold—if the above description of his apparatus is true—could shoot the dog, the marble leg, and finally Naomi herself, out into the invisible plane of spin electrons? This is why: The difference, as Muxhold himself recognized, between an atom resolved through addition or subtraction, and an atom which became split (apparently dissolved into nothing), was infinitely small. Only a hair's breadth separated the one from the other. So Muxhold's *Cabinet* and *Electron-dissolver* possessed the common faculty for doing this; and thereby was Wallace Land himself permitted to seek onto unknown planes for Naomi, following after the marble virgin. This is my answer to the criticisms of the story. If the readers of Science Wonder Stories favor my doing so, I will follow up "The Marble Virgin" with a sequel even more dramatic, even more scientifically founded, in which the readers will be permitted to renew some old acquaintances.

As you will see by the above, I am prepared to furnish a sequel to "The Marble Virgin." If, of course, you want it. And I hope that my answer to the criticisms of "The Marble Virgin" cover the points raised by the readers. I want both to entertain and to please them!

With all good wishes to you and Science Wonder Stories,

Ronnie MacDonald

Bolshevism vs. Fascism

Editor, Science Wonder Stories:

It is with a feeling of pleasure mingled with disappointment that I report the completed reading of the first issue of your new magazine.

All my criticism is centered on two stories: (1) The Reign of the Ray, and (2) Warriors of Space.

As to the first tale: The science and technique of the Reign of the Ray are excellent and I have no fault to find with them. I cannot say as much for the political and social structure. Let it be understood at the outset that I am decidedly opposed to the Soviet form of government. Dictatorships imposed by force and based on the theory that the people are made for the government do not appeal to me. Nevertheless, I honestly believe the authors of the Reign of the Ray presented a distorted and biased picture. Authors of scientific fiction, as a rule, are men and women of progress, who believe in evolution in all its phases. Soviet Russia, regardless of its defects politically and economically, has made tremendous strides along social and particularly scientific lines. This is a fact that cannot be disproved. Fascist Italy, on the other hand, notwithstanding its alleged economic progress, is slowly but surely returning to the medieval standards, which curtailed the thought and limited the action of the individual, which accepted the rule from above as the inevitable, which stifled inventive genius, and which allied itself with the rankest sort of intolerance and superstition. Yet in this story, the authors deliberately praise the Fascist form of government and bitterly denounce the Soviets. Both are dictatorships, both were imposed upon the people against their will, both are maintained by force. And the best that can be said is that Russia is slowly recovering her sanity and in time will undoubtedly realize that social democracy cannot be achieved by force, but only by education and not until the people are ready to accept it. Italy is daily becoming more and more conservative, dedicating its future to a false, antiquated, narrow conception of nationalism, which bodes no good for the efforts of republican and democratic nations to establish and maintain good will, peace and cooperation. Scientifically, Russia has completely outclassed Italy. Why, therefore, all this tommyrot on the part of the authors of THE REIGN OF THE RAY?

When reading WARRIORS OF SPACE, I could not help but contrast this story with other interplanetary tales that, in my opinion, were much superior to Mr. Marshall's offering.

I have no fault to find with the general theme: it is unique and entertaining, but somehow the romance feature was as out of place! All I can say is that Mr. Marshall is unquestionably a great scientific writer, his romantic expressions should be omitted, if possible, for they damage his otherwise fine stories.

So much for the brickbats! Aren't you glad?

I take off my hat in reverence to Stanton Coblentz. It is needless for me to state that all his stories are excellent and that his name is a guarantee that the work of his brain will satisfy and then some. His MAKING OF MISTY ISLAND was up to his usual high standard and I do not have to say any more. His stories are unique in that he manages to place himself above the world, its narrow aims, distorted desires and foolish quarrels. He is a prophet of the days to come, an idealist of the highest order. May his influence continue to spread!

The MARBLE VIRGIN was excellent throughout. There is only one question I would like to ask: The hero in the story made a woman out of marble—the scientist endowed it with life, but, to function as a normal woman this "creation" would have to be like a human being *internally* as well as *externally*. The sculptor, of course, could not make her so, and the story does not indicate that the scientist's cabinet did that. Yet we have a woman acting in a normal way; just a little bit hard to swallow, don't you think? However, I repeat, the story was excellent.

Dr. Keller's work is always of the highest order and his tale, THE THREAT OF THE ROBOT, is one of his very best. The moral is excellent and I am glad that he takes the part of the ordinary, average toiler and is not antilabor in his views as is the case with the authors of THE REIGN OF THE RAY.

The pages devoted to *Science News* were themselves worth the price of the magazine. I look forward to the next issue.

Please accept my criticism in the friendly spirit in which it is offered. I am greatly interested in the future of science fiction in America and I want to help you in your new venture as much as I can.

Maurice Rabinovitz,
Attorney-at-Law,
Washington, D. C.

(The editor accepts gratefully Mr. Rabinovitz' sentiments about the first issue of SCIENCE WONDER STORIES. While he takes no partisan view of the political sentiments of "The Reign of the Ray," he feels that very interesting things are happening in Russia, scientifically, at least, regardless of what her future destiny is. Many criticisms have been received about the creation of a woman from "The Marble Virgin." If we interpret Mr. McDowd's idea correctly he means that what happened in *a few seconds* in Professor Huxhold's cabinet to be the compression of a process which would normally *take a long time*. In other words, to carry on the dramatic interest he has shown in one step what might take a dozen or a hundred steps. The editor is very happy to count Mr. Rabinovitz among his readers and urges him to express his opinion fully. We want frank and unbiased criticisms.—*Editor*).

Why Is Empty Space Cold?

Editor, Science Wonder Stories:

I have read the first copy of your magazine, and I think it's a "wow!" It's as good as anything in print, and if it keeps on improving, there's no telling where we'll get. I see that Paul is up to scratch, as well as the writers. There's only one fault I have to find; that is with the type. Couldn't you make it just a shade or so darker?

There is one idea in all interspace stories that puzzles me. There is supposed to be an absolute cold in space. Why this is so I cannot see, for space is filled with ether and in outer space there is no obstacle to heat waves. Therefore, these should travel indefinitely and preserve all their original heat, because nothing has detracted from it. Therefore, space travellers should have to arm themselves against severe heat rather than absolute cold. If my reasoning is incorrect, will you kindly show me where?

M. Ashman,
Brooklyn, N. Y.

(Mr. Ashman's question about the cold of empty space is a fair one. Empty space is cold because it has no way of retaining the heat of the sun. Now as far as we know, empty space *is empty*. The theory of ether filling space has been pretty generally discredited. Some scientists believe that there is *some* material filling space, but that it is so diffuse as to be practically negligible. Now heat will travel on in waves until it strikes some object which can absorb it. Thus, a human being out alone in space would absorb the sun's heat and become warmed somewhat, momentarily. But the space around him, being completely empty, and therefore incapable of absorbing heat, would merely have the heat waves pass by it. Our human being would therefore radiate heat off to the cold surroundings and become almost as cold as the empty space around him. This is explained somewhat in Captain Noordung's article on "The Problems of Space Flying" in our July issue of SCIENCE WONDER STORIES.—*Editor*).

"Science News," a Student's Aid

Editor, Science Wonder Stories:

A few days ago I received my first copy of SCIENCE WONDER STORIES and was highly pleased with your first publication of this unique magazine.

Every article and story more than topped my expectations. The section *Science News of the Month*, certainly is a worth-while addition to the value and interest of the magazine and I already feel *I can converse more intelligently with the person who takes more time* for the reading and studying of these various calculations, discoveries and inventions than I do. Being only a sophomore in high school, I haven't had enough experience in the field of science to understand all the scientific material in your stories, but I certainly find them interesting to say the least, and wish you the greatest success with your future publications.

Dean St. Clair Mitchell,
Lincoln, Nebraska.

(Mr. Mitchell is one of the many students who writes to tell us what a wonderful help SCIENCE WONDER STORIES is to his school work. Mr. Mitchell will find as he goes on with the magazine that his knowledge of science will grow remarkably. He will be filing away, in his mind, the thoughts and ideas expressed by the authors, and the more that he learns the more he will be able to gain from each succeeding story. It is a process of growth that is as endless as nature itself. It is the mission of SCIENCE WONDER STORIES to instruct while it entertains.—*Editor*).

More on "Warriors of Space"

Editor, Science Wonder Stories:

Received the first copy of SCIENCE WONDER STORIES and am highly pleased with it. I especially liked the "Science News" department. The stories were all good so I will not comment on them. The cover as usual was a work of art. I would like to know what was the most popular kind of story. My favorite is interplanetary stories. I am glad that you are going to have articles on Space Flying. I also like the idea of publishing the pictures of the authors. The best story in the issue was "Warriors of Space." But I think they could have pulled Dione into the sun without taking Saturn and its whole system. What do you think? Are you going to have a quarterly? If so when will it come out?

Dudd Ornstein
Chicago, Ill.

(Offhand, we should say that Mr. Ornstein's criticism of the fact that Saturn was pulled into the sun with his eight planets instead of taking Dione alone, might be justified. But remember, however, that the forces that are involved are very complex, as was illustrated by Donald's pile of sheets with figures on them. It is perhaps one of these anomalies, if Donald's figures contained no errors, in which forces required to do work may be smaller or larger than they seem. The cover design in this issue illustrates this point forcibly. The editor wishes to state further that he is very pleased with the amount of discussion that "Warriors of Space" has aroused. It has more than justified the publishing of the story. The Quarterly will be out about September 15—*Editor*).

(*Continued on page 293*)

To Our Readers

OF late, the editor has received a great many communications from readers who desire to have us open a new department or perhaps incorporate it in "The Reader Speaks" department.

Our correspondents wish us start a department in which will be answered general scientific questions of interest to all.

We desire to put this matter to a vote and we ask you to be kind enough to fill out the coupon which you may paste on a postal card and send to us. We will then be in a position to know what the wishes of the majority are.

Editor, SCIENCE WONDER STORIES,
98 Park Place,
New York City.

I would like to see a department of scientific-technical questions and answers and I vote for it.....

I am not in favor of a scientific-technical questions and answers department and I vote against it.....

Name .....

Address .....

City ..... State.....

The Latest—The Best—The Lowest Priced!

For 25 years the management of this firm has sold merchandise by mail. This is our guarantee to you—
"We promise courteous treatment and prompt shipments."

Order Direct From this Page

WE PREPAY ALL ORDERS ABOVE 50 CENTS.
(Remit Five Cents extra postage for all orders below 50c)

Money Refunded if Goods Unsatisfactory

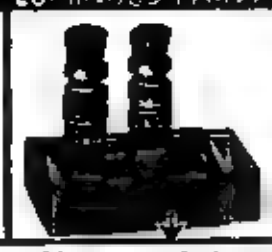
Remit by check, money order or U. S. Postage stamps. Canadian and foreign stamps not accepted.

REAL PISTOL

Here's a real pistol, yet small enough to be used as a watch charm. Illustration is full size. Imported, best European workmanship. Excellent reproduction of standard pistol. Cut shown pistol broken open to load blank cartridge. When trigger is pulled, cartridge goes off with a loud BANG that can be heard for a block. Pistol entirely made of steel, nickel plated. Handle is beautifully engraved. Octagonal barrel. Comes in box, with cleaning rod and 25 blank cartridge, AT NO EXTRA CHARGE.

No. 6500 Pistol.....Prepaid **$1.25**
No. 6500A Box of 25 Cartridges.....Prepaid .25

LUMINOUS PAINT



Make your own luminous articles. Paint watch and clock hands, electric light switches, push buttons, keyholes, house numbers, etc. 1,000 uses. Articles treated stand out brilliantly in dark. The darker the room, the more brilliance.

No. 6502 Luminous Paint
Prepaid 25c. No. 6502-A
Large Size $1.00

MAGNIFIER

This fine folding pocket magnifying glass, also called linen tester, is made entirely of gold lacquer brass. Has powerful lens that magnifies everything 10 times. Has fixed focus. Just open it and it is ready. When folded this magnifier occupies a space about as large as a quarter and twice as thick.

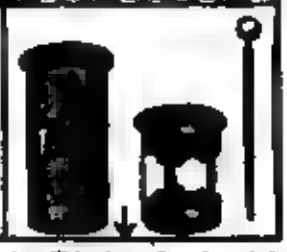
No. 6510 Magnifier
Prepaid 25c.

MICROSCOPE

Here is a real high power imported microscope for instruction and laboratory work. Has regulation rotating light mirror. Has adjustable lens for correct focusing. With it comes 3 specimen slides. Entirely brass. Packed in neat leatherette box.

No. 6512 Microscope
Prepaid $1.00

FLOROSCOPE



This is a fine imported combination microscope. Really two instruments in one. One end used for high magnification, such as seeing bacteria in milk or water. Other end to see parts of insects, flower specimens, etc. Finished in gold brass.

No. 6513 Florescope
Prepaid 65c.

FOOLEM

Box of tobacco rubber imitation. Can't be told apart when mixed with real ones. Get the laugh on your friends. Nothing like it. This is one of the cleverest novelties ever designed and is made amazingly well. Even the ends of the cigarette look like real tobacco.

No. 6501 Cigarettes
Prepaid Box 25c.

HOAX HANGER

Latest novelty out. This trick coat-hanger looks just like the regulation article. But try and hang a coat on it and—FLOP down it comes. Hanger has a spring hinge—even a hat pulls it down. Hanger is fastened to wall with nails or screws. Nickel plated.

No. 6503 Hoax Hanger
Prepaid 25c.

COMPASS

Fine imported magnetic compass. ACCURATE. Pocket size. Invaluable for hikers, automobilists. Often saves lives. Use it to tell live electric wires; make your own galvanoscope. Fully nickel plated. The actual article is about one-half again as large as illustration shown.

No. 6507 Compass
Prepaid 10c.

CHOKER

Cigar is made of sponge rubber. Fools everybody. Deception is perfect.

No. 6508 Rubber Cigar
Prepaid 15c.

Offer your friends or your girl some chewing gum—They try to chew it, till they find out its rubber! Five sticks to the packet.

No. 6518 Rubbergum
Prepaid 10c.

BOOTLEG PUZZLE

A real sticker. Just try and get the toy off the book. It will take you quite a while till you master the intricacies of this clever puzzle. Made entirely of metal. Nickel plated. Size of this puzzle is 1½"x1¼".

No. 6515 Boobug Puzzle
Prepaid 10c.

TRICK-SOAP

Loads of fun with this trick soap. Looks harmless and is intended to "get" the sheep who always uses your soap. When he uses it his hands get black at once and he needs real soap to clean his hands.

No. 6511 Trick Soap
Prepaid 15c.

BLUFFGUN

Bluff your friends with this gun. Made of composition metal handsomely nickeled. Exactly same size, weight and shape as real article. Fine to bluff burglars. Used also as desk paper weight. Size of this gun is 6¼" long and 3" wide.

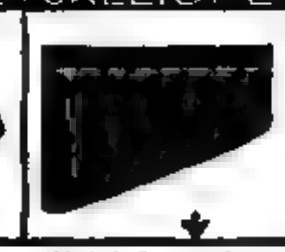
No. 6505 Bluffgun
Prepaid 30c.

PERISCOPE

See what's going on behind your back with this Rearbacktscope. Used like a magnifying glass. No one knows you're watching them. Gives you "eyes in your back." This article is made in molded bakelite and its size is 2"x1¼".

No. 6506 Periscope
Prepaid 10c.

CALLIOPE



Musical Calliope. Latest novelty. Made in celluloid. Light weight. 4¼"x3". Eight keynotes produce perfect Calliope musical effect. Simple to play—just blow. Plays like Harmonica. Exceptionally loud. Finished in different, attractive colors.

No. 6521 Calliope
Prepaid 15c

NOSE BLOWER

The real article! Conceal nose blower in your handkerchief and blow into instrument while you pretend to blow your nose. Everyone stops and looks at you. There never was a terrible noise like it. Keep it up as long as you like.

No. 6510 Noseblower
Prepaid 15c.

DICE GAME

Real Dice game. Press lever on side. When released, dice spin around on green cloth. Smallest game of its kind. Built ruggedly. Same size as your watch. Full nickel finish. Glass crystal. Has a ring to attach to your watch chain.

No. 6514 Dice Game
Prepaid 40c.

ROULETTE

Real roulette game. Press lever and arrow spins around. Never stops twice on same number in succession. Same size as your watch. Fully nickel plated, glass crystal. Loads of fun. Has a ring to attach to your watch chain.

No. 6512 Roulette Game
Prepaid 40c.

OOH-LA-LA RING

Handsomely carved gold filled ring. Looks just like any other ring. But, oh boy, wait till you look through the "VIEW" Strong magnifying glass shows French actress when viewed against light. Ring has large imitation diamond. When ordering enclose a strip of paper giving size of your finger.

No. 6511 Surprise Ring
Prepaid 15c.

MOVIESCOPE

Nearly pocket movie-scope. Has 3" japanned metal tube with strong magnifying glass. REAL pieces of regulation film are inserted in instant. Then view film against light. Each moviescope comes with a dozen REAL films. Some are in colors. Used also as magnifying glass. Neat box furnished.

No. 6522 Moviescope
Prepaid 15c.

TELESCOPE

A real telescoping telescope of astonishing power at last for a small price. Made entirely of brass as its bigger brothers. Lenses are scientifically ground. Nothing better made. Fits like pocket. Instrument is handsomely finished in gold lacquer brass and measures extended 6¼", closed 3¼".

No. 6504 Telescope
Prepaid 60c.

TELEGRAPH

Learn the code with this sounder. Telegraph your chum. Big demand for telegraph operators. We furnish complete set to learn all codes. By means of this instrument, it is possible for you to learn the Morse code in 30 days by practising an hour a day. 2 different codes are furnished. 1, Morse 2, International; 3, navy. Be sure to get this article.

No. 6512 Telegraph Sounder
Prepaid 75c.

WONDERSCOPE

NEW! Greatest pocket microscope invented. Looks like fountain pen AND ACTUALLY MAGNIFIES 25 TIMES. Hair looks as big as a rope. See pores in your skin. Has double adjustable lens. For home, laboratory and shop. Full black enamel and clip. This little instrument must be seen to be appreciated. Its size measures 5"x⅝".

No. 6503 Wonderscope
Prepaid 25c.

CIGARETBANG

Here boys is THE novelty. Box contains 4 dozen tiny wood pegs—but they ARE "treated." Push the sharp end of peg into cigarette about 1/2 in. Pegs are so small they're invisible. Then offer your friends the cigarettes. BANG, BANG! they do off — Yet ENTIRELY HARMLESS.

No. 6520 Cigaretbang
Prepaid 15c.

SCIENTIFIC NOVELTY COMPANY, 247 Greenwich St., New York City

SECRETS

The world's most amazing book, the "Silent Friend"—Marriage Guide and Medical Adviser, reveals hundreds of secrets hidden from the public for centuries. Exposes ancient magic, curious arts, conjuring secrets of lovers, gamblers, money-makers, reveals the Forbidden Cabala, includes the Treasure Casket of Mysteries. Ways to Wealth, Beauty Secrets, Manufacturing Formulas, Animal Training, Divination, Talismans and Charms. Ten astounding books in one great volume. For Adults only. Send No Money. Pay postmaster only $1.79 and postage on delivery. Dept. [illegible] Co., Woodbine, Pa., Box 702.

"A Bridal Eve"

The Bridal Eve. A Daughter of Eve. A Girl's Awakening. Love's Sweet Hour. Two Men and a Maid. A Mad Love. The Wiles of Love. An Artful Wooing. Love's Carnival. A Nameless Sin. The Hour of Temptation. 50 cents each. Any three for $1.00. All 12 for $2.50. Sent sealed in plain wrapper. General Delivery if desired. All orders must be prepaid in stamps or money order.

PARK PUBS. CO., 15 Rockaway St., New York, Dept. S-212.

X-RAY

KATHOSCOPE
Pocket Detector
Everybody wants it.

See your best girl and all she's doing. No one knows, but you see everything. Periscope operates in all climates, lasts lifetime, ready for use. $1.00 cash with order for this wonderful instrument and 3 astonishing French pictures. KATHOS CO., P. O. Box 330 City Hall Post Office, Dept. WS, New York City

Learn To Hypnotize!

Complete course of Hypnotism, Mind Reading and Magnetic Healing. 12 fascinating lessons. How to become an expert, hypnotize at a glance, make others obey your wishes, overcome bad habits and enemies, gain in power, wealth, love. Simple, easy system. Bound $20 course; now only $1. Send stamps cash, no money to pay.

EDUCATOR PRESS, 18 Park Row, New York, Dept. S-212

$100 FOR YOU A WEEK!

SELLING — Direct Company — Largest Line
CHIDTC Sample Outfit FREE
MEN'WEAR & UNDERWEAR
SHIRTS
[illegible]

AGENTS WANTED

GOLD LEAF WINDOW LETTERS and Script Signs. No experience, 500% profit. Samples free. CONSOLIDATED, 69-AX West Van Buren, Chicago.

FREE BOOK. Start little mail order business. Hadwill, 27A-74 Cortlandt Street, New York.

$15 DAILY selling custom quality shirts and ties. Largest cash commissions, extra bonuses. Outfits free. District managers wanted. Parmode, 15 Lenser Bldg., St. Louis.

CHALK TALKS

Laugh Producing Program $1.00. Catalog 10c. Baldo Art Service, Dept. N., Oshkosh, Wis.

PHOTOGRAPHIC ENLARGEMENTS

Send me 40c and negative and receive by return mail beautiful 8 x 10 glossy finish enlargement. Other photographic work at lowest prices. Send for circular to Charles, 210 Chestnut St., Camden, N. J.

SALESMEN WANTED

GET THE FRUIT OF YOUR EFFORTS. RARE OPPORTUNITY offered by large, long established manufacturers BRUSHES, BROOMS, MOPS, DUSTERS. Biggest commissions provided through greatest discounts. Crew Managers and Salesmen become independent merchandising men. Exclusive territories offer full protection. Write for sales proposition. WIRE GRIP SANITARY BRUSH CORP., 41-51 East 11th Street, N. Y.

SONG POEM WRITERS

SONG POEM WRITERS. Melodies written and arranged for publication. Write, Ernest Shonfeld, 2236 Olive Ave., Pasadena, Calif.

SONG POEM WRITERS—"Real" proposition. Hibbeler, D189X, 2104 N. Keystone, Chicago.

The Reader Speaks

(Continued)

Tells of Science Correspondence Club

Editor, Science Wonder Stories:

I want to take time to congratulate you on your magnificent magazine, SCIENCE WONDER STORIES.

I have read a few of the stories, but unfortunately I have no time to read them all, as corresponding with members of the recently created Science Correspondence Club has taken up much of my time. Up to date we have a membership of twenty-five enthusiastic science fiction fans all anxious to devour every bit of science fiction that they can grab. Later we may ask a little space in some corner of your magazine to report our progress. At present we are voting for officers.

I like your idea of inserting the authors' picture at the beginning of a narrative. The pictures by Paul are improving right along. Nobody can kick on the appearance of the cover or name of the magazine. They are both splendid.

The first thing I turn to in your magazine is the department "The Reader Speaks." I enjoy reading what other people have in mind on various subjects. "What Science Fiction Means to Me," a contest now running in your magazine, interests me greatly, and I note that the authors of the numerous letters have put a great deal of thought into the makeup of their letters. I am submitting my manuscript on "What Science Fiction Means to Me." Perhaps it will earn a place of honor in your columns.

In this letter you will find a money order which covers a year's extension to my subscription, and the subscription of two others.

"The Price of Peace," a science fiction story based on a future war, is nearing completion, and when done will be gladly submitted to you.

With best wishes for the success of our wonderful new magazine, the best science fiction magazine on earth, I remain,

A. B. MALOIRE,
Centralia, Wash.

(We are more than interested to learn about the Science Correspondence Club. Its idea is excellent and we wish to encourage it in all means within our power. We would like to hear more about it, its plans and aims. "The Price of Peace" sounds interesting and we look forward to it with anticipation.—*Editor*)

Brick-Bats and Bouquets

Editor, Science Wonder Stories:

Herewith my reaction to the first issue of SCIENCE WONDER STORIES. First of all, however, let me say that while I agree with Mr Neller in regard to the usual run of criticism based on personal bias, I offer no apology for the following, as you have very clearly stated that it will be your honest endeavor to be guided by the readers' wishes in all matters pertaining to the new magazine.

First, Brickbats.

By far the worst fault of the first issue lies in your publication of that piece of sentimental drivel, "The Marble Virgin." This story, aside from its pseudo-scientific background, is such as may be found in nine-tenths of the cheap fiction magazines that clutter the modern newsstands. The "science" in the story is worse than non-existent, for it gives the untaught reader a bunch of false ideas that are the very opposite to real science. It is impossible, despite your declaration to the contrary, that such scientists as Dr. de Forest and Professor Fitch could have passed on the science of the story. (I mention these as they are supposedly responsible for the validity of the physics contained in your stories).

Let me point out a few of the more obvious faults contained in this crude attempt at a science fiction story. The author has borrowed the old theme of science fictionists, wherein the scientist creates a ray capable of changing one element into another by destroying some of the electrons of the atoms of matter subjected to its influence. Nothing wrong so far. But when he changes a leg of marble into one of flesh and blood, the story becomes absurd. Kindly give me your attention while I point out to you just how ridiculous this is.

Marble is composed of a mixture of three components: mica, $KAlSiO_4$; quartz SiO_2; and

(Continued on page 284)

Learn Electrical-Mechanical Auto Expert

Learn AT HOME the Cooke "JOB WAY"

FREE! AUTO BOOK

MAIL THIS FOR FREE BOOK

E. W. COOKE

Name _____
Address _____
City _____ State _____
Age _____ Occupation _____

Learn PHOTOGRAPHY and Motion Picture Projection

FREE BOOK TELLS HOW

You can quickly qualify for positions paying $50 to $100 a week in Motion Picture, Portrait, Commercial or News Photography and Projection, or start your own business. No experience needed. Camera or Projector given. Learn at home or in our great New York Studios.

Write for Big Free Book of Amazing Opportunities, Job Chart and Camera or Projector offer.
N. Y. INSTITUTE OF PHOTOGRAPHY
10 West 33rd Street New York Dept. 170

CORRECT your NOSE

30 DAY TRIAL OFFER

FREE BOOKLET

Obtain a perfect-looking nose quickly. At home, while you sleep. GUARANTEED! 82,000 doctors, court praise Anita Nose Adjuster. Gold Medal Winner. Write today.

Anita Institute, H-62 Anita Bldg., Newark, N. J.

12 Cal. Blank Automatic

$4.29

Travel on "Uncle Sam's" Payroll

$158 to $225 MONTH
Men—Boys
18 or Over
Railway Postal Clerks
Mail Carriers
Today Sure

COUPON

FRANKLIN INSTITUTE
Dept. W245, Rochester, N.Y.
Rush to me free information telling how I can get a U. S. Government Big Pay Job. Send list of jobs now obtainable.
Name _____
Address _____

Situated in the heart of the financial and business district of Jersey City, the HOTEL PLAZA makes an ideal stopping place for the business man or motorist.

Single Room $3.00
Double Room $5.00

W. W. BENSON, Mgr.

HOTEL PLAZA
Journal Square, Jersey City

Every Aviation Question Answered
By VICTOR W. PAGE'S AVIATION BOOKS

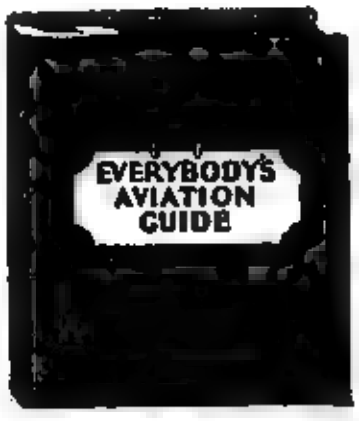
The A B C of Aviation by Major Victor W. Pagé, brings you the essential knowledge and understanding of aviation that every beginner needs. Major Pagé, who has been a leading instructor and engineer throughout the entire history of aviation, has condensed into simple every-day language all the information that is so vital to a beginner and so necessary to the layman who wants authentic, understandable information on every phase of aviation.

This unusual book lays before you the complete story of modern aircraft, its construction, engines, control and flight just as if Major Pagé anticipated all your questions and answered them for you. He weaves his story from the very beginning of aviation up to the adaptation of modern principles of flying. Every technical word that he uses is explained in the text, and he gives the reason for every statement he makes. 150 illustrations, 160 pages. Price $1.00.

Everybody's Aviation Guide, by Major Victor W. Pagé

This practical, non-technical book is written especially for the aviation enthusiast. It is a mine of information—tells all about the construction of airplanes and dirigibles and how they navigate the air.

Here you will find ten lessons logically arranged in question and answer form. Save your time—read this book—get the meat of the subject. It contains everything from elementary conceptions of mechanical flight and primitive forms of aircraft to a more advanced consideration of aerodynamic principles. 140 illustrations, 256 pages. Price, $2.00.



For Sale By
TECHNI-CRAFT PUBLISHING CORP., 98 Park Place, N. Y. C.

The Reader Speaks

(Continued)

feldspar, $KAlSi_3O_8$. This makes a total of four elements present with a consequent result of four types of electron plan in this material. If his ray is capable of knocking off a definite number of electrons from the atoms subjected to its action, the number being controlled by the operator, then it will make only four different elements, having their original proportion, no matter how many of the electrons he chooses to destroy. But if it reduces the number of electrons to a definite remainder, controlled by the operator, then it will result only in the conversion of the substance to a single element. The author speaks of the machine as as *electron dissolver*, hence it is incapable of *increasing* the number of electrons in the atom, and therefore cannot create elements of higher atomic weight from those of lower atomic weight. Therefore iron, whose atomic weight exceeds that of any element found in marble, could not result from the action of the device. Iron, as you are well aware, is a vital necessity to the human body. Even assuming that the machine could increase the number of electrons in the atom, the story is still absurd. The author speaks of flesh as if it were a homogeneous substance such as potassium or iron. In reality it is one of the most complex substances known. If his machine changes the number of the electrons at will—decreasing or increasing them as the operator desires—then he will be able to run the gamut of the fifteen or so elements found in living tissue, but at *any given instant* he would never have anything but a leg composed of a single element.

You will have to admit, Mr. Gernsback, that this story is an insult to the very name of science fiction. The fact that I, whose education in science does not exceed that obtainable in the ordinary high school, should be able to pick flaws in it, shows just how poor this story is.

Secondly, I notice that the board of associate editors does not contain a single chemist. Of all the modern sciences chemistry is the most familiar to the average man, and therefore should hold an important place in you rmagazine. I certainly hope that this is remedied

Second, Bouquets:

First, let me congratulate you upon the improved appearance of your new magazine. The cover of the first issue is a work of art and science combined; an infinite improvement upon the covers of your former publication. Artist Paul certainly does deserve a lot of credit. The spacing and wording of the title are also much more pleasing than previously.

I approve of the Science News department of your magazine most heartily. This gives an added educational value to the magazine and increases its worth a great deal. I notice that you quote several extracts from the *Science News-Letter*. I have been a reader of this paper for about two years and have found it far superior to the usual run of scientific magazines intended for the public at large.

As to stories, I think "The Reign of the Ray" is one of the best pieces of science fiction that it has ever been my privilege to read. I certainly hope that you publish more like it. The other stories, with the exception of "The Marble Virgin," are also very good.

Burris Cunningham,
Springer, New Mexico.

(Although the criticisms directed against "The Marble Virgin" are answered in part by the author himself in these columns, we wish to correct one idea of Mr. Cunningham relating to the impossibility of making the marble into flesh. He speaks of the necessity of iron in the body and other elements that would prevent the creation of new substances with higher atomic weights than are found in marble. Now this should be understood. The marble statue was heavier than the body of the living woman. That may be granted without dispute. It is well known further that all basic elements of an atom—protons and electrons—weight the same. It is merely the number of electrons and protons to an atom that make up the atomic weight. Therefore in marble we will have more than enough such basic elements of matter to make human flesh. What Professor Huxhold would naturally do would be to break down the marble into its basic protons and electrons and then combine them to form the necessary new atoms to build up the flesh, bones, blood and what-not necessary for the human body. We rather appreciate Mr. Cunningham's interest.—*Editor*).

(Continued on page 286)

5 BOOKS for 50c

Brand New Science Fiction Stories

We are presenting to our readers the first six numbers of our new **Science Fiction Series.**

The Editors of SCIENCE WONDER STORIES have received such a large supply of really excellent science fiction stories, that we have decided to publish some of them in book form. These small books, illustrated by artist Paul, are printed on a good grade of paper and are sold at a low price, due to the large amount put out. The series in time will form a beautiful library of the best that is to be had in science fiction. New ones will be issued from time to time.

REMEMBER THESE ARE BRAND NEW STORIES AND HAVE NOT BEEN PUBLISHED BEFORE AND WILL NOT BE PRINTED IN ANY MAGAZINE. THEY CAN ONLY BE SECURED THROUGH THE **SCIENCE FICTION SERIES.**

Every book contains but a single story by a well-known science fiction author.

The type is large and well-readable, and the size of each book is 6x8 in., which makes it convenient to carry one of them in your pocket.

NOT LESS THAN FIVE BOOKS SOLD. We accept cash, money order or U. S. (no foreign) postage stamps.

Below you will find a list of the first six books. Your choice of five books for 50c or the entire six books for 60c. prepaid.

All orders filled promptly.

STELLAR PUBLISHING CORP.

98 PARK PLACE, NEW YORK, N. Y.

WHEN THE MOON FELL
By Charles H. Colladay

Collisions between celestial bodies of any size have not occurred within historical times. But such an event is not an impossibility. In fact many astronomers believe that our solar system came into being by such a collision. Suppose the moon were to crash into the earth. What would happen? In "When the Moon Fell," by Charles M. Colladay you will find the

NOT LESS THAN FIVE BOOKS SOLD

THE BRAIN OF THE PLANET
By Lilith Lorraine

If a super-intelligence could have its wisdom poured into our brains, what a different world we might have! Miss Lorraine in the "Brain of the Planet" poses such a problem and works out the answer in an astounding

THE THOUGHT PROJECTOR
By David H. Keller, M.D.

The power of suggestion on the human mind forms the basis of "The Thought Projector," by Dr. David H. Keller. Ideas repeated over and over exert a great force on us, they penetrate our minds and give us ideas that we often think are our own.

AN ADVENTURE IN VENUS
By R. Michelmore

Aviation five hundred or a thousand years hence will probably be something beyond most of our present conceptions. Journeys to other planets may well become a commonplace as it does in the present story showing an exciting "Adventure in Venus."

WHEN THE SUN WENT OUT
By Leslie Stone

The sun is said to be slowly cooling, and generations many thousands of years hence must face the problem of how their heat and light is to be provided when the sun's end does come. In this thrilling story, "When the Sun Went Out," Leslie Stone answers that question.

THE GIRL FROM MARS
By Jack Williamson and Dr. Miles J. Breuer

Suppose some one from another planet landed on our earth. What would happen? "The Girl From Mars," by Jack Williamson and Dr. Breuer is an adventure of a Martian visitor, with all the strange situations that one can imagine in such an event.

STELLAR PUBLISHING CORP.,
S.W.-98 Park Place, New York, N. Y.

Gentlemen:

I am enclosing herewith $ ..... for which please send me prepaid the books which I have marked with an X:

- ☐ 1 THE GIRL FROM MARS
- ☐ 2 THE THOUGHT PROJECTOR
- ☐ 3 AN ADVENTURE IN VENUS
- ☐ 4 WHEN THE SUN WENT OUT
- ☐ 5 THE BRAIN OF THE PLANET
- ☐ 6 WHEN THE MOON FELL

Name .....

Address .....

City ..... State .....

MANHATTAN
BEACH
HOTEL
Manhattan Beach, N.Y.
Live in a modern fireproof hotel by the seashore for less than in the crowded city.
$9.00 per week for one
$12.00 per week for two and up.
All hotel services included
Phone Sheepshead 3000
D. Lindy, Mgr. Director
57 MINUTES FROM TIMES SQUARE VIA BROOKLYN BEACH SUBWAY

Ten Tools In One

For the —

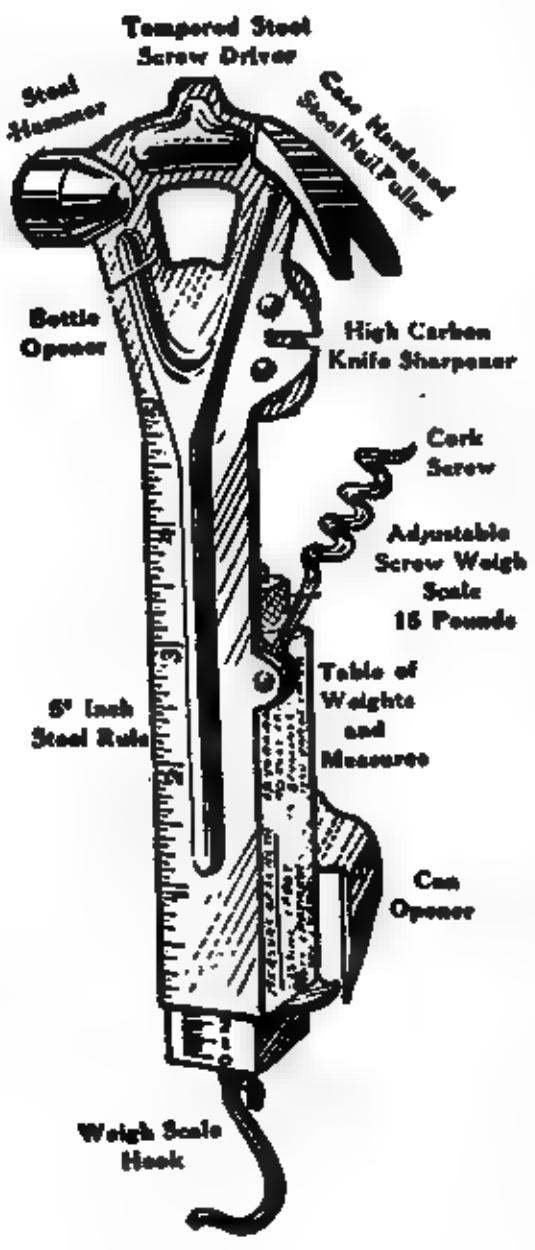
Shop
Builder
Mechanic
Household
Handyman

10 utilities in one article
(only 10" high)

Send Only
$1.00

We Pay Postage

Grenpark Tool Co.
245 Greenwich St.
New York, N. Y.



The Reader Speaks

(Continued)

Explains Celestial Mechanics

Editor, Science Wonder Stories.

I read "Warriors of Space" and want to correct an idea I have found in it.

The idea is advanced that the solar system is barely balanced and inherently instable. Nothing could be farther from the truth. The idea that a slight force could draw Saturn into the sun is ridiculous.

The solar system would automatically adjust itself to almost any changes you could make in it. A planet falling into the sun would be as plausible as an atom destroying itself by the electron uniting with a proton. It could only happen when the planet was near enough to our star to cause friction against its gases.

If the speed of any planet was doubled it would merely take up a new orbit farther from the sun. If it was halved the planet would take up an orbit nearer the sun. If the retarding force was supplied suddenly it would be a sharp ellipse, otherwise almost a circle.

Some of the brilliant authors who keep talking of planets falling into the sun should whirl a ball on a string around their finger, allowing it to wrap around to draw it closer and closer. Even with the tremendous comparative retarding influence of air resistance and friction they will note it takes no sudden plunge, but on the other hand is pulling away harder as it is drawn inward. This is natural as although the ball is slowing down its orbit is so much shorter it circles faster and its centrifugal force increases. This would be the effect on a planet drawn near the sun.

Why, I'll make you a bet you could cut Saturn's speed clear in half—imagine the force required—then put it very close to the sun, within Mercury's orbit, and let it go and, not only would it fail to fall into the sun but it would be hurled much farther away from the sun.

Your authors should watch comets. If there is the slightest comparative sideward motion to a comet it will not plunge into the sun. In fact the closer it comes the harder it will be hurled back.

I can think of one good simile in the case. Take a hammer and hit it against an automobile tire, resolving that it should immediately come to rest on the surface of the tire. It will bounce back, if you swing hard or easy. Only in this case you can finally hold it there because of malleability. In astronomy everything is perfectly elastic. There are only two contingencies that would permit the occurrence. 1, stopping all sideward motion; 2, the entraping of the body in the atmosphere of the sun. As the sun and Saturn are like a pea and a baseball several thousand miles apart this would be hard to attain.

James G. Scribner,
Portland, Oregon.

(We believe that although Mr. Scribner has made a nice analogy, and drawn a fairly deductive picture, yet he doesn't present the whole picture. The analogy of whirling the weight on a string is not complete. For in that case the pull on the string is increased by the centrifugal force and the finger merely supplies enough muscle power to maintain the string. The finger in other words is purely passive. But gravitation acts much differently. Saturn in its present orbit is acted on by the pull of the sun, and the speed of Saturn is such that it provides a centrifugal force to balance that pull. But move Saturn to half its distance from the sun and the sun's pull *is multiplied by four*. Reduce the distance to one-quarter of its present distance and the sun's pull *is multiplied by sixteen*, the pull being inversely proportionate to the square of the distance. Now while all this is taking place the planet is describing a spiral in space, each rotation about the sun bringing it closer to the sun (by virtue of the pull of the space cars). Now with the constantly increasing pull of the sun, Saturn would tend to fall into a new orbit with an orbital speed proportionate to its new conditions. It would thus provide a new state of equilibrium. *But the space cars prevent such an equilibrium;* for even while the sun's pull is increasing faster than the increase in Saturn's orbital speed, the space cars are providing enough of an extra pull to keep the planet moving closer and closer. The only fair analogy is the rotation of a ball around a very powerful magnet. Then we believe Mr. Scribner would see a point approached when the pull of centrifugal force would seem to collapse and the ball would rush toward the magnet at an amazing speed.—*Editor*\.

DO NOT READ THIS AD

If You Do Not Own a Radio Set. But Everybody Interested in Radio Should Have a Radio Encyclopedia

S. GERNSBACK'S RADIO ENCYCLOPEDIA is the only standard work ever published in America attempting to classify alphabetically the countless words used in the highly specialized science of RADIO. The ENCYCLOPEDIA is written in plain English so that everybody can understand the definitions and descriptions.

No expense has been spared, covering over two years in compilation, to make it worthy a place in your library.

It is published in one volume—168 pages—size 9 x 12 inches, nearly an inch thick and nicely accommodates the beautiful illustrations and the large, easy to read type.

The work contains 1,930 definitions, 549 photographs, drawings and diagrams.

REMEMBER THIS IS A REAL ENCYCLOPEDIA—NOT A DICTIONARY—and very few of the things described and illustrated in this volume can be found in any dictionary, or any other encyclopedia.

Edited by SIDNEY GERNSBACK, Author of "Wireless Course in Twenty Lessons"—"One Thousand and One Formulas" — "Practical Electricity Course"—"The Radio Educator," etc.

Former Price $2.00

Now for a Limited Time $1.49

SEND NO MONEY

Just forward the Coupon below and the Encyclopedia will be sent you at once. You pay the Postman $1.49 plus postage on delivery and if the book is not satisfactory return it and your money will be paid back at once without any questions.

ISKOR PRESS, Inc.
286 Fifth Ave., New York

ISKOR PRESS, Inc.,
286 Fifth Avenue, New York. Dept. S-8.

Send me one copy of Sidney Gernsback's First Radio Encyclopedia in one volume as advertised. I will pay postman $1.49 plus postage on delivery.

Name .....

Address .....

Town and State .....

Only $4.85

Sale $4.68

Double Action Revolver made from finest materials. Highly polished and nickel plated octagon barrel, well rifled. All parts drop forged. 22, 32 or 38 cal. Send No Money. Pay expressman $4.68 plus carriage charges on delivery. Winchell Mail Order, Box 82, Wardbins, Pa.

SEX THROUGHOUT THE AGES

By Dr. David H. Keller, M. D.

10¢

84 Pages of Constructive and Helpful Information. Can be read and understood by any intelligent sixteen year old child. Contains profitable reading for young and old. Partial List of Contents: Natural Selection; Varieties of Married Life; Love and Marriage; The Prostitute; Woman's Sexual Position; Feminine Independence, etc.

Send 10 cents today for this great book. Sent prepaid.
POPULAR BOOK CORP. - 99 Park Place, N. Y. C.

BOOK REVIEWS

CORRECTION NOTICE

In the June issue of SCIENCE WONDER STORIES, the price of "The Sun, the Stars and the Universe," by W. M. Smart, published by Longman's, was erroneously stated as $3.25, instead of $5.00, which is the correct price. .

AT HOME AMONG THE ATOMS,

by James Kendall, A. M., Sc. D., F. R. S. 310 pages, illustrated, stiff cloth covers, size 5x8, published by The Century Company, New York, price $3.00.

Professor Kendall attempts what might be considered the impossible, to explain to one, who is presumed not to have a knowledge of chemistry, the mystery of atomic structure. But with confidence he tackles his task and with charm he succeeds in it. And he is not content alone to explain the more or less easily understood Bohr theory of atomic structure in which the protons and electrons arrange themselves after the model of the solar system. He goes on bravely to explain the theories of Schrodinger and de Broglie which transform our atomic structure from merely round little balls of material (electrons) revolving about a nucleus (the proton) to a theory in which the atom is made of a halo of energy in wave form vibrating around the nucleus. If this is hard to understand it is certainly not Professor Kendall's fault, for during the book he takes his reader through the stages of an understanding of chemistry, and the road one travels rises only gently into the rarefied realms of atomic structure. One should not miss this book, for with it he can bravely essay to more difficult and detailed descriptions of what we and all things about us are made of.

THE LIFE OF THE WHITE ANT,

by Maurice Maeterlinck, translated by Alfred Sutor. 238 pages, stiff cloth covers. Size 5 x 7¼. Published by Dodd, Mead & Company, New York. Price $2.50.

In his introduction, Mr. Maeterlinck states that his book does not belong to the school of romantic biography. Yet, even though every fact concerning these astounding insects has been discovered and confirmed by specialists in research concerning the termites, the facts themselves are often so astonishing as to give the work the external aspects at least of colorful and fantastic fiction. The book follows the general plan of the author's other book, "The Life of the Bee," which you should read along with this, if you have not already done so.

These insects are, like the bees, units of a powerful and irresistible central intelligence but, even more than their distant winged relatives, they possess ingenuity in unusual situations, and greater ability to adapt themselves to varying conditions. This is forcefully illustrated in the great number of species, each with definite variations, and each possessing its own unique innovations for combating the exigencies of nature. One very interesting chapter describes the devastations which these animals wrought, and still do, in their habitat, destructions which are often humorous in nature but just as often tragic.

For any student, and more especially for any critic, of our present civilization, this little volume should prove stimulating. The civilization of the white ant, or termite (their classification has not, as yet, been definitely determined) is so efficient as to reflect in an often disconcerting manner on our own, so far as economy of action and degree of organization are concerned.

Maeterlinck has carried the comparison a degree further, and suggests that the civilization of man, if it continues in the direction it has been going, is headed for a terrible and gloomy destiny much like that of the termites, "unless," as he hints provocatively, "in the meantime we have destroyed one another, which seems infinitely more likely."

Pick the RADIO Job you want and fill it - - in only 9 months

Radio Operator $90—$200 per month with all expenses paid.

Broadcast Operator $1,800—$4,800 a year.

Radio Repair Mechanic $1,800—$4,000 a year.

Radio Inspector $2,000—$4,500 a year.

RADIO pays from $2,000 to $25,000 a year. Get the "How" as well as the "Why" of Radio—with this expert training! Only an hour or so a day—in spare time—is all you need! As part of your course, you receive absolutely free of charge—a magnificent outlay of apparatus. With this outfit you learn to build fine sets and solve the problems that bring big pay.

Money Back if Not Satisfied

The course prepares you for success in all phases of Radio—manufacturing, servicing, selling, ship and shore broadcasting, Television and Photoradiograms. A signed agreement backed by RCA assures you of complete satisfaction upon completion of the training—or your money will be promptly refunded.

Free Book

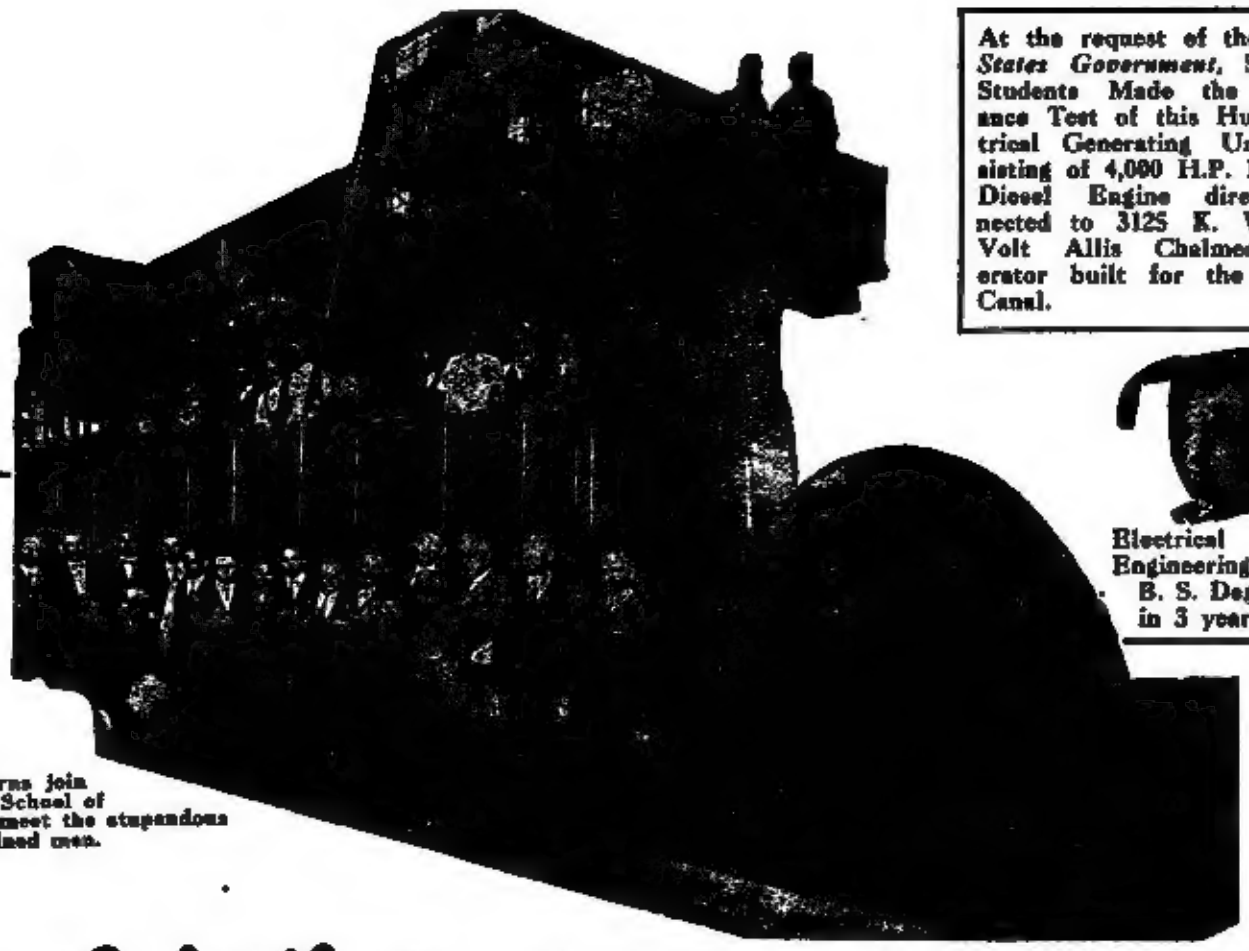
It tells in 50 fascinating pages and photos all about Radio's brilliant opportunities for advenure and success. Mail the coupon now—the book is absolutely free! Radio Institute of America, Dept. W-8 326 Broadway, New York.

Radio Institute of America
Dept. W-8
326 Broadway, New York, N. Y.

Gentlemen: Please send me your big FREE 50-page book which tells about the brilliant opportunities in Radio and about your famous laboratory-method of guaranteed radio instruction at home.

Name .....

Address .....



Big Milwaukee electrical concerns join hands with the School of Engineering to meet the stupendous demand for trained men.

At the request of the *United States Government*, S. of E. Students Made the Acceptance Test of this Huge Electrical Generating Unit, consisting of 4,000 H.P. Nordberg Diesel Engine direct connected to 3125 K. W., 2300 Volt Allis Chalmers Generator built for the Panama Canal.

Electrical Engineering, B. S. Degree in 3 years

Men of Action WANTED FOR Commercial Electrical Engineering

TAKES you out of the class of the common laborer of which there is always an over plentiful supply at cheap rates of pay. Makes you a **Graduate Electrician, Junior Electrical Engineer,** or **Commercial Electrical Engineer** in 12 short months. Puts you in line for a job where big manufacturers are actually pleading for trained men and glad to pay **Big Salaries** ranging from $2,000 to $10,000 a year. Not a dream—**A DEAD SURE FACT!** For 25 years we have trained men for the electrical profession and **Our Graduates Have Succeeded in All Parts of the World.** Our 12 months intensive training is the boiled down essence of what **We Know** fits men for big paying positions. It is work you'll love. **No limit** to advancement. **Practical engineers teach you.** They know **What** to teach and **How** to teach it, so **you can earn money with it.** Hundreds of thousands of dollars worth of actual commercial machinery to work on in this school.

Uncle Sam Asks S. of E. OK!

Think of the opportunity to test plants such as this. The Nordberg Manufacturing Company is only one of many large concerns that is cooperating with School of Engineering students. This type of practical work, while in school, insures your future when you graduate. That's why our men are always in demand and always command big salaries. You can be one of these men if you ACT!

Earn While You Learn

By our special system you may earn part of your way while learning. Our Employment Department will help ambitious men who can finance their tuition to secure a position to which they may devote a part of each day, spending the remainder at the school. Low tuition fee. Board and room reasonable. Daily Broadcasting W I S N (formerly WSOE). School Orchestra. Fraternities.

Write for FREE Catalog

Write today for our free, illustrated catalog. Read about this wonderful institution and the great opportunities that lie before you. Find out about our specialized method of training and the details of our "Earn While You Learn" plan.

Radio and Electrical Refrigeration

Learn in three months—just 90 days and you can be one of the new group of trained men who will guide and develop the newest and best paying of America's gigantic industries. Radio and Electric Refrigeration are tremendous money makers for the trained man who gets into the game early. Experts are needed for big, responsible, well-paying jobs. We train you quick and help place you in a good position. ACT NOW!

SCHOOL of ENGINEERING of Milwaukee
Founded 1905 S.W.S.-829 Milwaukee, Wis.

School of Engineering of Milwaukee
Dept. S.W.S.-829, Milwaukee, Wis.

Without obligating me in any way please mail free Photo Story book, "Rise to Success Through Electricity" (just off the press), and NEW Bulletin regarding the course I have marked with an X.

[ ] Commercial Elec. Eng. for High School Grad., 1 year
[ ] Commercial Elec. Eng. Others 1 to 2 years.
[ ] Elec. Eng., B.S. Degree 3 yrs.
[ ] Automotive Elec.
[ ] Elec. Refrigeration
[ ] Radio
[ ] Armature Winding
[ ] Light, Heat & Power
[ ] Practical Electricity
[ ] Home Lab. Service
[ ] I am interested in your Earn While You Learn Plan.

Name ..... Age .....

Address .....

City ..... State .....

Education .....

Did You See the First Issue of RADIO-CRAFT?

25c THE COPY — ON ALL NEWSSTANDS

If you have perused the first issue of this new magazine, you will have noticed that the text is 100% radio and that its editorial contents is purely along constructional and experimental lines.

The magazine caters only to the custom set builder, the experimenter, the constructor, the radio "fan," the man who's hobby is Radio.

A GERNSBACK PUBLICATION

DON'T miss the August issue, on the newsstands July 5th. If you are at all interested in Radio, you will like this number even better. Among the many articles contained in the August issue are the following:

MOORE-DANIELS RECEIVER, by Alfred J. Daniels
CONE DIAPHRAGMS AND SECTOR DIAPHRAGMS, by Dr. Eugene Nesper (Berlin)
HOW TO BUILD A GIANT FREE-EDGE CONE REPRODUCER, by Louis Gancher
CONE PULLEYS SOLVE TELEVISION SYNCHRONIZING, by C. Sterling Gleason
RADIO PROGRAMS FOR MOTION PICTURE THEATRES, by W. L. Woolf
HOME TALKIES AND THE RADIO, by A. Pam Blumenthal
THE RADIO COLOR SCREEN, by W. F. Prideaux

SHORT-WAVE CRAFT

A COMPLETE PORTABLE SHORT-WAVE TRANSMITTER AND RECEIVER, by Lawrence B. Robbins
SOME NOTES ON SHORT-WAVE OPERATION, by Robert Hertzberg
HOW TO BUILD A 2-IN-1 RECEIVER, by Louis B. Sklar

LATEST THINGS IN RADIO — SERVICE MAN'S DATA
RADIO-CRAFT KINKS — INFORMATION BUREAU
BOOK REVIEW

REGULAR SUBSCRIPTION RATES

$2.50 in U. S., 25c. a copy;
$3.00 in Canada and foreign.

Special Charter Subscription Price:

8 Issues for $1.00

TECHNI-CRAFT PUBLISHING CORPORATION,
S.. 8-29, 98 Park Place,
New York, N. Y.

Enclosed find $1.00 for which enter my subscription to your monthly magazine, RADIO-CRAFT for 8 (eight) months. Please mail all copies to address below:

Name .....

Address .....

City and State.....

Amazingly Easy Way to get into ELECTRICITY

Don't spend your life waiting for $5 raises in a dull, hopeless job. Now . . . and forever . . . say good-bye to 25 and 35 dollars a week. Let me show you how to qualify for jobs leading to salaries of $50, $60 and up, a week, in Electricity—NOT by correspondence, but by an amazing way to teach, that makes you an electrical expert in 90 days! Getting into Electricity is far easier than you imagine!

Learn Without Lessons in 90 DAYS

Lack of experience—age, or advanced education bars no one. I don't care if you don't know an armature from an air brake—I don't expect you to! I don't care if you're 16 years old or 48—it makes no difference! Don't let lack of money stop you. Most of the men at Coyne have no more money than you have.

Railroad Fare Allowed

I will allow your railroad fare to Chicago, and if you should need part-time work I'll assist you to it. Then, in 12 brief weeks, in the great roaring shops of Coyne, I train you as you never dreamed you could be trained . . . on the greatest outlay of electrical apparatus ever assembled in any electrical school . . . costing hundreds of thousands of dollars . . . real dynamos, engines, power plants, autos, switchboards, transmitting stations . . . everything from door bells to farm power and lighting . . . full-sized . . . in full operation every day!

No Books-No Printed Lessons

No books, no baffling charts . . . all real actual work . . . right here in the great Coyne school . . . building real batteries . . . winding real armatures, operating real motors, dynamos and generators, wiring houses, etc., etc. That's a glimpse of how we make you a master practical electrician in 90 days, teaching you far more than the average ordinary electrician ever knows and fitting you to step into jobs leading to big pay immediately after graduation. Here, in this world-famous *Parent school*—and nowhere else in the world—can you get such training!

Prepare for Jobs Like These

Here are a few of hundreds of positions open to Coyne-trained men. Our free employment bureau gives you lifetime employment service.

Armature Expert, to $100 a Wk.
Substation Operator
$80 a Week and up
Auto Electrician $110 a Week
Inventor . . . . . Unlimited
Maintenance Engineer
up to $350 a Week
Service Station Owner
up to $250 a Week
Radio Expert up to $100 a Week

Jobs-Pay-Future

Dont' worry about a job, Coyne training settles the job question for life. Demand for Coyne men often exceeds the supply. Our employment bureau gives you a lifetime service. Two weeks after graduation Clyde F. Hart got a position as electrician for the Great Western Railroad at over $100 a week. That's not unusual. We can point to Coyne men making up to $600 a month. $60 a week is only the beginning of your opportunity. You can go into radio, battery, or automotive electrical business for yourself and make up to $15,000 a year.

Now in Our New Home

This is our new, fireproof, modern home wherein is installed thousands of dollars' worth of the newest and most modern Electrical Equipment of all kinds. We now have the largest amount of floor space devoted to the exclusive teaching of practical electricity in the world. Every comfort and convenience has been arranged to make you happy and contented during your training.

GET THE FACTS

Coyne is your one great chance to get into electricity. Every obstacle is removed. This school is 30 years old—Coyne training is tested—proven beyond all doubt—endorsed by many large electrical concerns. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs . . . facts . . . jobs . . . salaries . . . opportunities. Tells you how many earn expenses while training and how we assist our graduates in the field. This does not obligate you. So act at once. Just mail coupon.

Get This FREE Book

Mr. H. C. LEWIS, President
COYNE ELECTRICAL SCHOOL, Dept. 79-01,
500 S. Paulina St., Chicago, Ill.

Dear Mr. Lewis:
Without obligation send me your big free catalog and all details of Railroad Fare to Chicago, Free Employment Service, Radio, Aviation, Electricity, and Automotive Courses, and how I can "earn while learning."

Name.....

Address.....

City ..... *State*.....

COYNE ELECTRICAL SCHOOL

H. C. LEWIS, Pres. Established 1899

500 S. Paulina Street • Dept. 79-01 • Chicago, Illinois